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MEDICAL RECORD

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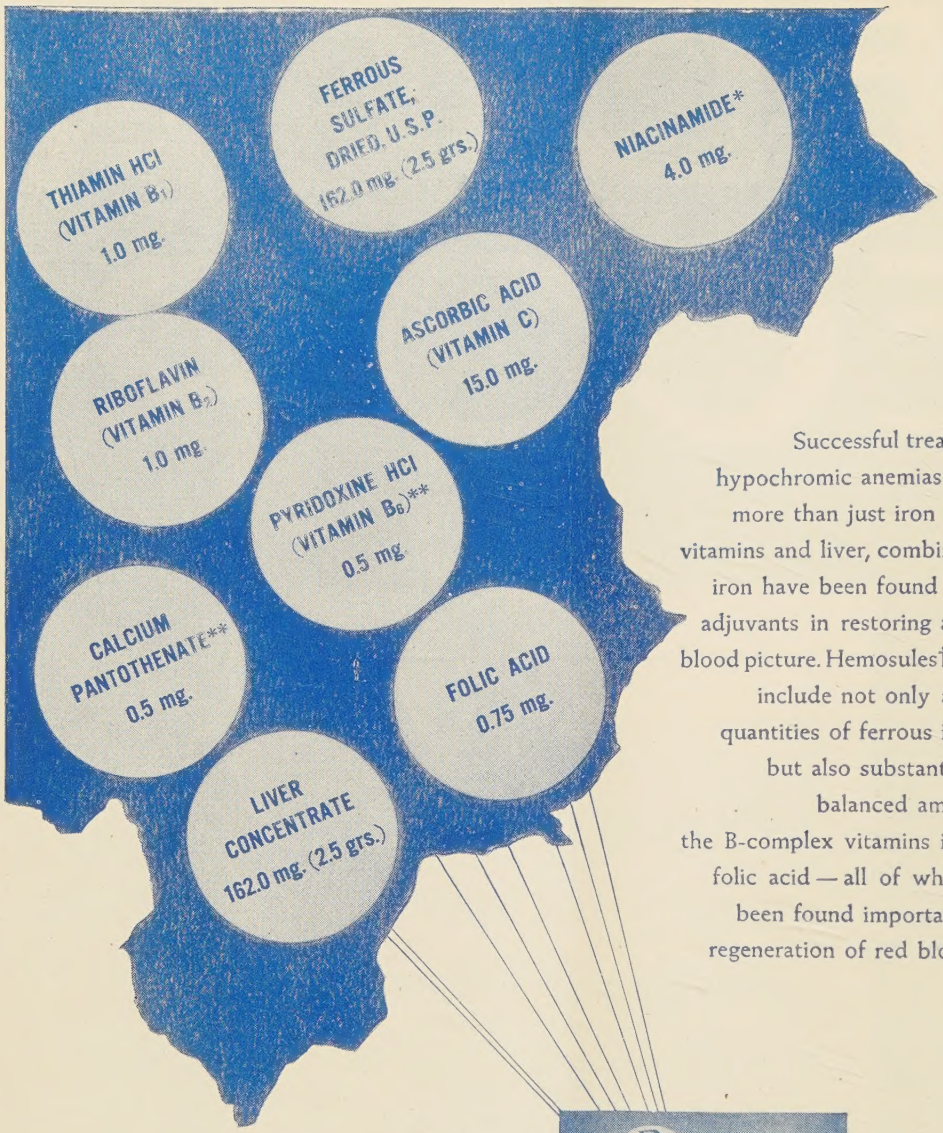
Neither hunger nor satiety, nor anything that exceeds the natural bounds, can be good or healthful.

—*Hippocrates*

JUNE-JULY 1948

Vol. 161, No. 6-7



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Hemosules†

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**The need for pyridoxine hydrochloride, calcium pantothenate and folic acid in human nutrition has not been established.

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All the advantages of Procaine Penicillin in Oil . . .
none of the disadvantages

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Wycillin provides a stable aqueous suspension of the new chemical compound, crystalline procaine penicillin G. It brings to the service of the physician for the first time a preparation for aqueous injection which avoids the dangers, pain and irritation of oil and wax and has many distinct superiorities:

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Wycillin is used in the same dosage and in the same conditions as Procaine Penicillin in Oil or Penicillin in Oil and Wax.

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'Dexedrine' Sulfate—because it curbed appetite and lowered food intake—enabled even this extremely obese patient to lose weight easily and safely without the use (and risk) of such potentially dangerous drugs as thyroid.

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In addition to the weight reduction of 118 pounds and the concurrent lowering of blood pressure, a remarkable improvement is reported in the patient's mood and outlook. Earlier nervousness and fears have vanished.

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JUNE-JULY, 1948

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VA Offers Training For Vet With Speech Defect

World War II veterans, totalling an approximate 100,000 who suffered speech impairments in service, may be eligible for special restorative training established by Veterans Administration to help them overcome their handicap.

This training is available under the Vocational Rehabilitation Act (Public Law 16) for disabled veterans, when:

1. The speech impairment interferes with the satisfactory employment of the veteran or the successful completion of his vocational training.

2. The physical and mental condition of the veteran is such that speech correction training may be pursued satisfactorily.

3. There is good promise that specialized training will overcome or reduce significantly the veteran's handicap.

In some cases there may be the possibility that speech impairments can be improved by medical or surgical treatment, VA said. These services will be offered eligible veterans before they are entered in the special speech correction programs.

The type and amount of special training will vary with the needs of each eligible veteran.

Generally the training will be offered in speech clinics of colleges, universities, medical centers, hospitals and public schools; speech clinics operated as adjuncts to guidance or mental hygiene clinics; private speech correction clinics and in curative workshops.

The training centers selected by VA must be qualified and equipped to furnish the specialized training needed by the veteran.

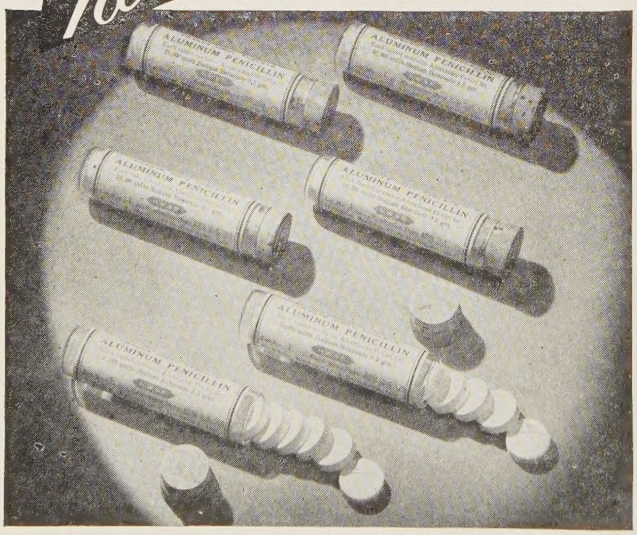
The center must have on its staff competent speech pathologists and correctionists who meet the standards set by the American Speech Association. The physical facilities, equipment and materials of the center must be adequate to furnish effective training. Medical services for necessary diagnostic purposes must be available.

Also on the Veterans Administration's agenda is a comprehensive follow-up program, designed to enhance and prolong the effects of hospital treatment, among thousands of veterans suffering from tuberculosis. More than 13,000 veterans afflicted by this disease now are under the care of VA. A total of 80,763 veterans are receiving compensation or pensions for tuberculosis.

Dr. John Barnwell, chief of Tuberculosis Service in the Department of Medicine and Surgery, said that this program is designed to discover relapses among tuberculosis sufferers early so that further treatment may be instituted promptly. It further is designed to help prevent advanced disease and thus contribute toward the safeguarding of others through the control of communicable tuberculosis.

All patients will receive further exams, plus additional treatment and a period of rehabilitation.

New Aluminum PENICILLIN*



Aluminum Penicillin Oral Tablets provide for maximum utilization of the dose administered. Low solubility of the aluminum salt renders it much less liable to inactivation in the stomach. Destruction in the intestinal tract is inhibited by the addition of sodium benzoate.

Aluminum Penicillin in Oil for intramuscular injection is a bland suspension of the new relatively insoluble aluminum salt of penicillin in peanut oil alone. Fluid at body temperature, it has the outstanding advantages of not causing pain or sterile abscesses. Slow absorption is accomplished by the slight solubility of the drug itself.

Aluminum Penicillin Oral Tablets. 12 tablets, 50,000 units each.

Aluminum Penicillin in Oil. 1 cc. size ampules, 300,000 units per cubic centimeter.

* Patent applied for.

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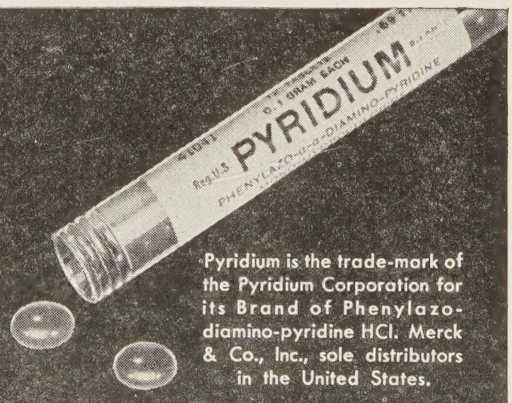

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Open Forum

RADIOACTIVE ISOTOPES IN MEDICINE

T. SWANN HARDING
Falls Church, Va.

Six years ago the total quantity of radium in the world was approximately 1 kilogram.

The column of water that rose above Bikini Lagoon at the time of the second atom-bomb test contained the equivalent of more than a hundred tons of radium. What this means for medicine thus becomes obvious. Again, six years ago it would have taken a skilled chemist hours of work to detect a millionth of a gram of phosphorus, whereas today a technician with a Geiger counter can detect a millionth of a millionth of a gram of radioisotopic phosphorus in a few minutes.

The ability to follow in detail the action of drugs or the distribution of hormones, has cast a wholly new light on problems of medicine, metabolism, and structure; it hints also at new therapeutic methods. Thus radioactive phosphorus palliates certain types of leukemia and of polycythemia vera, and somewhat retards cell myeloma. Radioactive isotopic iodine is taken up by an occasional cancer of the thyroid and its metastases, and some of the isotopes in colloidal form may be taken up by the reticuloendothelial system and thus irradiate tumor cells.

Ionizing radiations affect cells qualitatively in similar fashion, largely through interference with their nucleic acid metabolism. Hence external radiation may be absorbed by almost any of the various bodily cells. In internal radiation, however, there is poor penetration by certain types of radiation and certain tissues have specific affinities for certain elements—bone for phosphorus—thyroid for iodine and so on—permitting a degree of localized selective radiation.

Radioactive isotope therapy seeks to take advantage of these selective localizations and to use them therapeutically. First, the inherent toxicity of the substance itself must be considered—thus strontium, which might otherwise prove useful because of its localization in growing bones, is ruled out. Next, one must consider the material's half-life, for that having a long half-life is much more dangerous than that with a short. Yet the material must have a half-life sufficiently long to permit shipment. Again, sodium is relatively limited in use because the sodium ion is highly diffusible. The range and type of radiation tend to limit the region affectively treated to the immediate vicinity.

Finally, the element must have a reasonably high specific activity; thus radioactive calcium with a half-life of 45 days might be quite suitable in therapy, except that its specific activity is relatively low, hence it is difficult to get an effective concentration at any one point. Therefore, relatively few substances fulfill the requirements. Then the lesion must be one that may be treated satisfactorily by ionizing radiation, and there must be a fair differential between the sensitivity of the abnormal and the normal cells.

It is not surprising, that radioactive-isotype therapy is more limited than might at first be imagined.

Radioactive phosphorus aids some leukemias, as well as polycythemia vera; iodine 131 is good in rare carcinomas of the thyroid; and gold 189 is helpful in some malignant processes where either direct injection into the tumor is utilized, or the selective uptake of colloidal substances by the reticulo-endothelium system is of value. Phosphorus 32 is probably the treatment of choice in polycythemia vera, as some patients can get along with one treatment every year or so—though it may later prove to increase the number of cases which terminate in acute leukemia.

Radioactive iodine is of particular interest because of its selective localization in the thyroid —normal, hyperplastic, or in some cases even tumorous. But the treatment of choice in hyperactive thyroid remains surgery, and also the thyroid may be very effectively irradiated by the usual type of Roentgen therapy. If, however, a thyroid tumor or its metastases are sufficiently radio-sensitive to regress with radioactive iodine and equally good result may be achieved by external radiation. The use of colloidal radioactive gold is an interesting approach to the tumor problem, but not yet a method of choice.

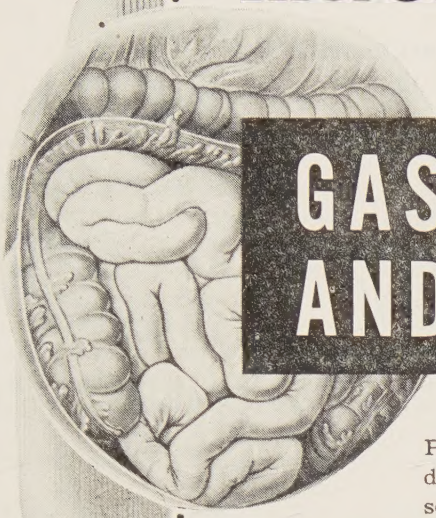
So far the therapeutic application of radioactive isotopes is limited though fascinating. But their use as tracers offers a fertile field for research. This new tool is as significant for research as was the invention of the microscope. It is something new to be able to recognize not only a faint trace of an element, but specific atoms of that element, and to be able to trace a molecule of glucose from its ingestion to its incorporation in tissue or its excretion. The tagged atom makes such things possible. But only the unstable radioisotopes which, in shifting to a more stable form, emit a characteristic irradiation are useful for this purpose.

Stable isotopes are not radioactive and usually have to be recognized by use of the spectrometer. But, by suitable combinations of radioactive and stable isotopic atoms in molecules it may prove possible to follow their chemical mutations with greater accuracy. Heavy water, carbon 13, and nitrogen 15 are prominent representatives of interesting and useful stable isotopes.

It may also be well to avoid the use of long-lived isotopes like carbon 14, in tracer experiments involving human beings, because of its dangerous emission of alpha particles, and to use nonradioactive carbon 13 instead. In general,

(*Continued on page* 328)

in this seasonal increase in

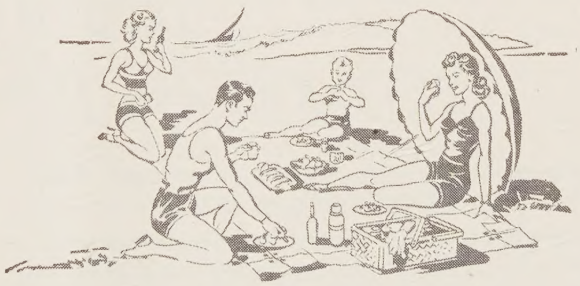


GASTROENTERITIS AND COLITIS

Paocin exerts a valuable local detoxifying and demulcent influence in acute gastroenteritis and colitis so frequently encountered during the hot summer season. Through this combined action, it reduces the frequency of liquid stools, and controls the associated discomfort.

It presents a suspension of colloidal kaolin and pectin in a pleasantly palatable vehicle. By combining the powerful absorbing faculty of kaolin with the detoxicant influence of pectin—the well known therapeutic principle of fresh apples—Paocin is a quick acting, highly effective antidiarrheal preparation. It does not paralyze intestinal activity, but instead combats diarrhea by both toxin neutralization and by its demulcent soothing action on inflamed intestinal mucosa. These actions are particularly valuable in all types of functional diarrhea, as well as in ulcerative colitis.

Paocin is supplied in gallon and pint bottles. Also available in tablet form, in bottles of 1,000, 500, and 100. At all pharmacies.



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radioactive isotopes with shorter half-life, especially those that emit beta rays—as well as some which emit gamma, may be used safely in dosages too small to have an observable biological effect but sufficiently large to be traced and thus useful in biological experimentation.

—Granite Gables

Betatron For Cancer Research Installed At The University of Illinois Medical College

The world's first installation of a betatron for cancer treatment and research is at the University of Illinois college of medicine, Chicago, in the Medical Center District. The University will pioneer in medical use of this instrument, science's newest source of high-energy x-rays and electrons.

The 20 million volt betatron was invented in 1940 by Donald W. Kerst, physics professor of the University who immediately pointed out its cancer fighting possibilities.

X-rays now used in hospitals for treating deep cancers are of 200,000 to 2-million volts energy. The 20-million volt betatron may in the future become standard for deep treatment after the way has been blazed by the University.

Prof. Kerst's first instrument in 1940 produced 3½-million volt x-rays. Within a year he had a second instrument producing 20-million volts. This became the prototype of the industrial betatron, such as is to be installed at the medical school. Now he is building a 300-million volt betatron for physics research, to produce cosmic ray effects in the laboratory and open entirely new doors to science.

Tests by Prof. Kerst and associates have proved that 20-million volt x-rays not only have great energy, but also will have the medical advantage of concentrating more effect inside the subject rather than on the surface. X-rays now used medically have their greatest effect at the point of entry into the body, and only a small decrease to the point of exit.

The Illinois scientist, using material which absorbs rays equally with a living body, has found that 20-million volt x-rays have their greatest effect approximately 1½ inches (3-4 cm.) inside the surface, and that after passing through 8 inches (20 cm.) of the material their energy is only about one-half that

(*Continued on page* 330)

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IODINE

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FOR INTERNAL ADMINISTRATION

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A superior product which may be administered over an extended period of time with little probability of causing gastro-intestinal disturbances or iodism.

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from fear
of conception
when
pregnancy
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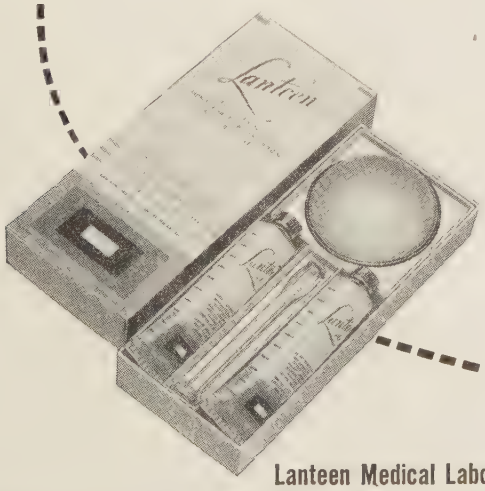
Ethically promoted—Advertised only to the medical profession.



Whenever pregnancy is contraindicated, maximal protection is assured by the new Lanteen technique. This NEW TECHNIQUE gives dual protection—the mechanical protection of the Lanteen Flat Spring Diaphragm plus the spermatocidal activity of Lanteen Jelly.

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Lanteen Diaphragms, made of the finest rubber, are guaranteed against defects for a period of one year.

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Lanteen

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of the maximum point. The 8 inches corresponds to an approximate thickness of the human body.

This means for medicine that surface damage, at points where the ray beam enters and leaves the patient, will be less, and at the same time that the x-ray dosage is concentrated in maximum on the deep internal organs where it is desired. The betatron has other advantages in easy and precise control of energy produced, and in a very narrow, sharply-defined ray beam.

A 20-million volt betatron is not much larger than an office desk. It is 36 inches wide and 81 inches long. A base, lifting the machine so that the beam comes out at a convenient working height, puts the top of the machine 84 inches from the floor. It weighs 5½ tons. A condenser bank and a control panel which weigh an additional 5 tons complete the equipment.

The main part of the betatron is an electromagnet, between whose circular pole faces is a doughnut-shaped porcelain vacuum tube 19 inches in diameter. Electrons released in this tube are accelerated by the field of the alternating current powered magnet.

In 1/720 of a second the electrons spin 300,000 times around inside the vacuum tube, travelling 250 miles, and attaining a velocity just short of the speed of light, 186,000 miles per second. Then they are deflected to strike a platinum target. Bombardment of the target by the electrons produces the x-rays.

It is estimated that at least a year of intensive study by medical scientists will be necessary before they can be safely used on a human being. Such research now is handicapped by lack of a betatron available full time for medical purposes.

Glyceraldehyde Helpless In Protection Of Teeth Decay

Dr. James H. Shaw, Harvard School of Dental Medicine reported to members of the International Association of Dental Research that the rare chemical glyceraldehyde, will do nothing to protect the teeth of human beings against decay.

Stating the results of experiments on animals, Dr. Shaw said that glyceraldehyde added to the standard test ration for a 14-week period failed to slow down the usual rate of decay or curb its extent.

The fact that glyceraldehyde in test tube experiments notably retarded the production of acid from carbohydrates was widely hailed last fall as the most promising tooth-decay preventative yet discovered. The suggestion to test the effectiveness of this compound under conditions in the animal mouth was made by Dr. Robert C. Hockett, scientific director of the Sugar Research Foundation, who secured the only two pounds of this rare compound in the world for the tests at Harvard.

During a 14-week period cotton rats and white rats were separated into two groups, one group receiving from one half to two percent of glyceraldehyde mixed with the regular carbohydrate part of

(*Continued on page* 332)

POST - OPERATIVE INSOMNIA

As a means of overcoming restlessness and insomnia during post-operative convalescence

PASADYNE

IS IDEAL

It is therapeutically reliable, does not disturb the gastric function, depress the circulatory system or habituate the patient to its use.

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Experience is the Best Teacher

Paul Ehrlich
(1854-1915)
proved it in chemotherapy

Paul Ehrlich, expanding on his knowledge gained as a pupil of Koch, concluded from his experiences in the staining of bacteria that there was a close chemical affinity between the cellular body and the stain. This idea led him to believe that specific drugs could be found which would kill invading pathologic organisms, without damage to the host. His conclusions helped create the science of chemotherapy, which is increasingly important today.

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According to a Nationwide survey:

More Doctors Smoke CAMELS
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the ration, and the other control group receiving no addition to the standard diet.

Dr. Shaw reported to the Association that the addition of glyceraldehyde caused no significant reduction in the average number of decaying teeth per animal nor in the average extent of decay per animal.

He further pointed out that rats, who were fed one and two percent of this chemical, failed to grow at a normal rate after the fourth or fifth week.

The rat colonies at Harvard provide a unique method for testing the effects of various nutrients on rates of tooth decay. A decay-susceptible strain of rats whose rate of dental decay approximates those of human beings has been carefully bred for these experiments. It has been determined that on a standard purified diet, decay will appear in certain teeth at predictable intervals.

By changing the components of the diet, one at a time, the possible role of various nutrients or added chemicals in reducing the amount of decay can be established.

Commenting on the 14-week study, Dr. Shaw declared that it shows a definite difference between reaction in an animal where the decay process is steady, and experiments performed in a test tube.

It may indicate that much of the effort being made to test acid-inhibiting compounds in the laboratory without using animals, may at best, lead to results of doubtful value.

POST - OPERATIVE INSOMNIA

As a means of overcoming restlessness and insomnia during post-operative convalescence

PASADYNE

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It is therapeutically reliable, does not disturb the gastric function, depress the circulatory system or habituate the patient to its use.

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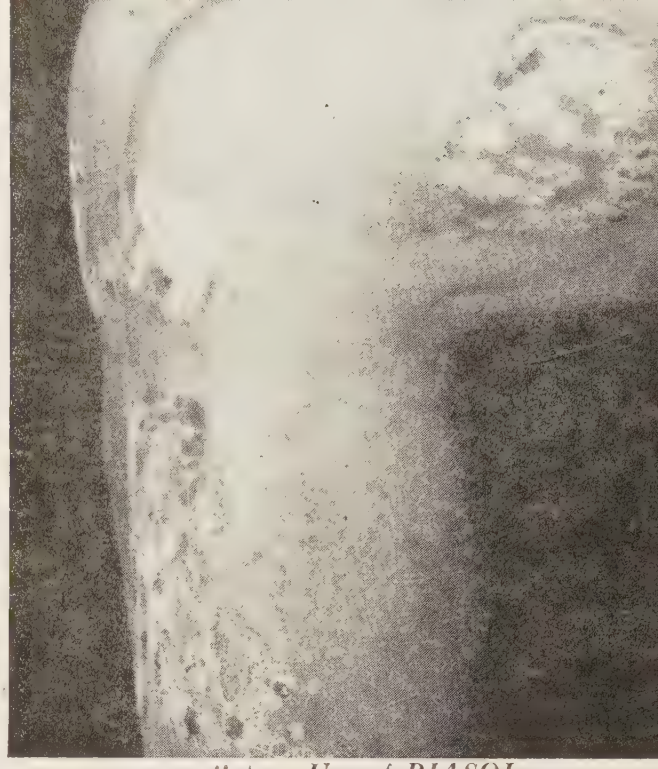

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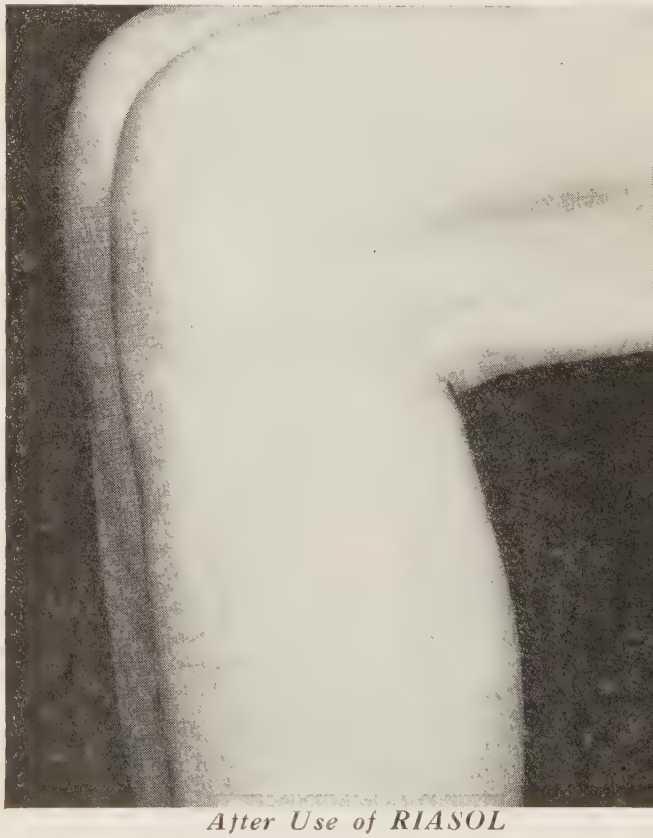

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RIASOL for PSORIASIS

Critique

Business and science

In *Science*, August 2, 1929, H. Newell Wardle told how an ancient and honorable institution, the Academy of Natural Sciences in Philadelphia, was disrupted when "misguided trustees, chosen for their business ability to manage the financial affairs of an institution, have the power, without asking expert advice, to wreck a scientific department." The Department of Archeology was said to have been disrupted when Charles M. B. Cadwalader, who had no museum experience, was made managing director of the Academy and sold the Clarence B. Moore collection, the finest of documented Indian antiquities!

Effects of irradiated ergosterol

One of the early articles in this field was, The Action of Irradiated Ergosterol in the Rabbit, by Maurice I. Smith and E. Elvove of the U. S. Public Health Service. (See Reprint No. 1285 of that institution, May 24, 1929.) It was found that repeated administration of 2 mg. and upward orally or intramuscularly could prove fatal to full-grown rabbits in a short time. Doses of 1 mg. or less, three or four times a week were well tolerated. Large doses of irradiated ergosterol produced a more or less marked hypercalcemia and smaller doses produced variable results. The inorganic phosphate of the serum, though subject to considerable normal fluctuations, appeared to be definitely increased when large doses were given. Toxic doses produced great excess of calcium in the tissues. This calcifying action was highly selective, however, involving especially the aorta, the kidneys and the lungs but not, for instance, the liver or striated muscle.

Cost of medical care

A long lead editorial in the *Jour. Am. Med. Assn.* for August 10, 1929, lugubriously discussed Doctors of Medical Practice and the Cost of Medical Care. The writer of the editorial was strongly moved to righteous anger by things "yawpers" like this writer and others, had been saying in print about the high costs of medical care and scientific means of reducing them. Both writers were found to be comical, exaggerated, half-baked, and sarcastic.

The writer of the editorial was much too angry to make it brief, so that even its argument can scarcely be reproduced here, but those of you who are interested in the matter of better medical care at lower cost to the ultimate consumer, might care to hunt it up and peep into history. It is rather amusing that at this time the writer of the editorial was quite willing to hold everything until the Committee on the Costs of Medical Care reported; when it did report, recorded history saith the writer of the editorial found that report most obnoxious and accused the Committee of trying to force Communism on the U. S.!

Experimentation on the healthy

W. E. Dixon in his presidential address to the Physiology Section of the British Association for the Advancement of Science, July 24, 1929 (*Lancet*, July 27, 1929) said "It has been often stated that the action of remedies may be best determined by experimenting with them on healthy men. This is not true; quinine was used to treat malaria, yet no one of the subjective symptoms induced in man has the remotest connection with its curative properties. The same is true of the use of the iodides in syphilis and the salicylates in rheumatism . . . Subjective sensations are, it is true, produced which are erroneously attributed to the drug which has been taken." Dixon then recounted an experiment that he and Rivers had carried on with caffeine, "because it illustrates the imaginary sensations and effects produced by S. Hahnemann and his pupils, by Perkin with his retractors, and by more modern physicians with their mystic apparatus."

Healthy men on regular regimens as to sleep, exercise, and diet, practiced daily with the ergograph till their work output was constant. Caffeine administered, dissolved in water, one hour before the experiment, greatly increased their work output for the day; this was done repeatedly with the same result. But it was not the caffeine. For "the effect was due to the ritual of taking a drug; the drug day assumed an enhanced importance in the mind of the operator and the mental effort sometimes referred to as suggestion was principally responsible.

"We had no difficulty in showing that water made bitter with a trace of quassia or some simple bitter had a similar effect. Few, if any, experiments made on man without most careful controls are of any real value. Properly controlled experiments have been made, however, with many substances."

The Function of Experiment in Knowledge

Thus was titled an article by J. MacMurray, in the *Proceedings of the Aristotlelain Society* for 1926-27, as reported in *The American Journal of Philosophy* (1928 pg. 272) by Harry T. Costello: "Science is a method of discovery in which overt practical activity plays an essential part . . . Science is based on a double skepticism. It is skeptical of the validity of both pure thought and of sense perception . . . It is not merely logical fallacy of which (the scientist) is suspicious. He claims the right to maintain side by side two mutually exclusive theories of radiation, on the ground that each is experimentally justifiable in a particular region . . . The scientist is just as skeptical of observation as he is of logic . . . He relies

upon the bare use of his senses as little as possible, and balances observation against observation, and one observer against another . . . Indeed he is always extremely skeptical of any alleged fact which is in logical contradiction with his own scientific theory.

"Observations must be relevant, not merely relevant to the particular question in mind, but more especially to the stage which the theory has reached in its continuous development . . . A scientific 'fact' is always a fact in relation to theory, always a generalization . . . Scientific development rests primarily upon those experiments which turn out contrary to expectation. We might almost say that the scientist experiments, not to prove his hypothesis, but to prove it false . . . It is thus the perfect weapon of a science whose basis is skeptical and whose aim is the unmasking of ungrounded belief . . . Is it possible thus to make ignorance the basis of knowledge, to build truth upon an unshakeable skepticism?

"Science, it would seem, has accomplished the impossible . . . By giving up the quest of certainty as an impossible task, it has succeeded in becoming the irresistable force which it undoubtedly is . . . Philosophy itself might become scientific . . . Like science, philosophy would have to exchange conviction for development, cease to entertain the vain hope of certainty, and supplement its natural skepticism of fact with an equally solid skepticism of theory and speculation."

Meat consumption Says P. Boissonnade, in his *Life and Work in Medieval Europe,* "In Frankfort, in the fifteenth century, the consumption of meat was as high as 125 to 150 kilograms per head; as much as it was at the beginning of the nineteenth century. A traveller of this period remarks that in the Low Countries and England 'more folk die of too much eating and drinking than of the pains of hunger.'"

Mystery *Science* for August 16, 1929, said that, at the summer meeting of the Pacific Division of the American Association for the Advancement of Science, in the Psychological Section, "J. Ball discussed a method of quantitative measurement of sexual excitability in the female albino rat", but it offered no further elucidation.

Iron and copper in nutrition One of the early papers on the effectiveness of copper in certain anemias was by Steenbock, Hart and associates in the *Journal of Biological Chemistry* for July 1929. Pure ferric chloride fed at high levels would not correct milk anemia in rats, but if derived from standard iron wire it would do so, apparently because contaminated with copper. Such anemias could be cured by the addition of plant or animal ash to the milk; again the deficiency causing the anemia was found to be in copper.

Light *Science* for August 16, 1929, contained material from Dutcher and Honeywell of Pennsylvania State College indicating that light from a Mazda bulb for eight hours a day appeared to increase the ash of the femur bones of rats. It was suggested that longer wavelengths of light possibly possessed ossifying power, because the ultraviolet flow from a filament bulb is mighty small. But chickens on a leg-weakness-producing diet did better when exposed to sunshine than when merely exposed to light from a quartz mercury-vapor lamp.

Antisocial ideas Says Ross, in *Social Control,* "A man may take up with an antisocial idea, but he hesitates to pass it on. Occasionally a thief declares the propriety of 'saving one's own bacon,' but the sentiment that circulates most easily in thiefdom is the vileness of 'splitting on one's pals.' Whispers slip furtively from mouth to ear about 'discretion' being 'the better part of valor,' but what the stay-at-homes shout to the warrior is, 'Bring back your shield, or be brought back on it.'

"Take Latins in small batches under tongue-loosening conditions, and you get chuckling confidences about feats of gallantry. Take the same men in larger groups, and the ideas or ideals of conjugal fidelity enjoy as much currency as they would among Anglo-Saxons. We must not forget that a man recommends to others, not what he likes, but what he likes others to like. The opinion of buccaneers is strangely disdainful of wassail and women till snug harbor is reached. The libertine is careful not to spread an appetite that might ravage his own family. It is the expredatory who have the most to say for the sacredness of the rights of property. Men, for the most part, take superior moral standards as they take coin, not for personal use, but to pass on to the next man."

Love of pleasure Said Lange in his *History of Materialism*: "The love of pleasure with which this age is so much reproached is, on a comparative view of the history of civilization, not nearly so prominent as the passion for work in our industrial chiefs and the compulsion to work in the slaves of our industry. Very often, indeed, what seems to be noisy or senseless joy in frivolous amusement is nothing but the result of immoderate, galling, and brutalizing labor, since the mind, by perpetual hurrying and scurrying in the service of money-making, loses the capacity for a purer, nobler, and calmly devised enjoyment."

Mistakes You have to learn from the mistakes of others because you simply will not live long enough to make all of them yourself.

THE CRITIC.

Progress Report Outlines Advances in N. Y. Mental Institutions During Last Five Years

More than 24,000 employees and a budget that now exceeds one hundred million dollars are required to operate N. Y. State's 27 mental institutions, according to the current progress-1947 to March 1948 report, issued by Dr. Frederick MacCurdy, commissioner of mental hygiene. Outlining the advances made in the last five years by the Department of Mental Hygiene, the report brings up to date the status of each phase of that agency's comprehensive long-range program for improving the lot of the mentally afflicted in the State.

It was brought out in the report that during the last five years there has been a vigorous effort to improve and expand the services in the state mental hospitals and schools, emphasizing curative rather than mere custodial care, making effective use of new developments in the field of psychiatry, and providing to the fullest possible extent for the comfort and happiness of their 107,000 patients.

The effectiveness of the therapeutic approach is indicated to some degree in the fact that during the year almost 20,000 of these patients were on convalescent status at home or elsewhere in the community. Funds for mental hygiene have been steadily increased. For the coming year the legislature has appropriated $107,000,000, which represents an increase of more than $35,000 over the current year.

Improvement in the personnel situation consists of inaugurating a 40 hour work week and ward personnel, who customarily put in 48 hours, now receive additional compensation amounting to 20 percent of their weekly salary. The general cost of living bonus provided for all state employees in the 1948 budget, added to the recent increases in institution salaries and the overtime compensation provided by the adoption of the 40 hour week, brings the wage level to a point where it is attracting to state mental hygiene institutions many desirable employees who might otherwise have found more lucrative positions elsewhere.

A significant innovation has been the provision that every ward attendant receive 80 hours of formal and informal instruction based on a standard training manual developed during the year by the department's committee on nursing. Also for the first time a four-week seminar in psychiatric nursing was held for principals of the departments' schools of nursing and chief supervising nurses from the state's 27 mental institutions.

One of the most significant advances in the training program has been the growth of the food service training school. Intensive courses in modern principles of quantity food preparation, designed for food service managers, dietitians, and chefs, were begun at Hudson River State Hospital in the fall of 1946. During the past year plans were completed

(*Continued on page* 338)

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Results Of Prefrontal Lobotomy Brain Operations Is Theme Of Connecticut Cooperative Project

Dr. Fredrick C. Redlich, associate professor of psychiatry and mental hygiene and executive officer of the department of psychiatry at the Yale Medical School, reports that 200 so called "hopeless" patients to be discharged from mental institutions are being studied under a program called the Connecticut Cooperative Project on Lobotomy.

"Of these 200 patients," Dr. Redlich said, "all of them were severe and you might say hopeless cases in 1947. One year after operation eight percent were symptom free. One-fifth were able to hold jobs, and a half of them could be discharged from institutions. Only 10 percent remained unimproved or got worse."

Yale was a pioneer in the development of the operation, Dr. Redlich stated. As a result of an operation performed in 1934 on the brains of two chimpanzees by Dr. John F. Fulton, professor physiology, Yale Medical School, and his fellow-scientist, Carlyle Jacobsen, it was observed that the animals failed to show frustration when unrewarded and developed a "don't care" attitude.

After an operation was reported at the 1935 International Neurological Congress in London, Dr. Egas Moniz of Lisbon, Portugal, developed procedures for performing the operation on humans. Since then, between 5,000 and 10,000 Americans have undergone lobotomies at psychiatric centers in this country.

Most patients lobotomized at

(*Continued on page* 340)

The high incidence of spontaneous abortion is frequently due to a temporary deficiency of the corpus luteum hormone *during the transfer of function from ovary to placenta.* "The administration of progesterone in relatively small amounts may be sufficient to maintain or even stimulate placental function over the critical period when the corpus luteum secretion decreases and the placenta is becoming a secretory organ." [1]

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1. MacGregor, T.N., and Stewart, C.P.: J. Obst. & Gynaec. Brit. Emp. 46:857, 1939

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and construction begun on the remodeling of a building at Hudson River to house the school.

The school, when completed, will consist of an assembly room; library; office; laboratory for demonstration and practice; refrigeration; storage and delivery room; and dressing rooms. The quantity foods laboratory will be fully equipped in accordance with recommended specifications for institution kitchens.

Classes will be limited to 25 or 30 students. Training will include lectures, demonstrations, practice in the laboratory and supervised practice in the hospital units. It is expected that this systematic education will be extended to all food service personnel through supervisors who have attended the school.

With the improvement in services for mental patients it has been necessary in many instances to increase the quotas for various types of institution personnel. Three million dollars has been appropriated for additional staff in the 1948-49 budget.

Requests for increased quotas are based on extensive surveys conducted by the department in nearly every phase of its institutional functions. These surveys, many of which were completed during the past year, have ascertained in terms of the department's present objectives the personnel needs of all state hospitals and schools. Typical of early action taken on the findings will be the creation of more than 200 new positions in occupational therapy, now under consideration.

The objective of the program is to see that employees at all levels are properly grounded in the fundamental theories and practices of their respective fields.

Six new units, with a total capacity of approximately 9,000 patients, have become available to the department in the past year. Willowbrook State School in Staten Island, built for the Department of Mental Hygiene and immediately turned over to the War Department upon its completion in 1941, has been returned to the state with the arrangement that part of the facilities will be leased to the Veterans Administration for temporary use as a veterans hospital.

It is planned that by March 1949, 1,400 mental defectives will be under care at Willowbrook. Three new state buildings designed for mental patients were requisitioned by the War Department in 1943, to be used as the Mason General Hospital. This institution has now been discontinued and the buildings have reverted to the state, providing some 3,800 new beds.

The solution to the problem of overcrowding lies of course in the long-term building program of the Department of Mental Hygiene, which aims at replacing unsafe and antiquated buildings, providing efficient modern facilities for essential services, and preparing adequately for future increases in admissions. The legislature has already appropriated $66,392,125 from the state's postwar reconstruction fund for 92 of the proposed projects, providing almost 14,000 new beds and the necessary medical and maintenance facilities to serve them.

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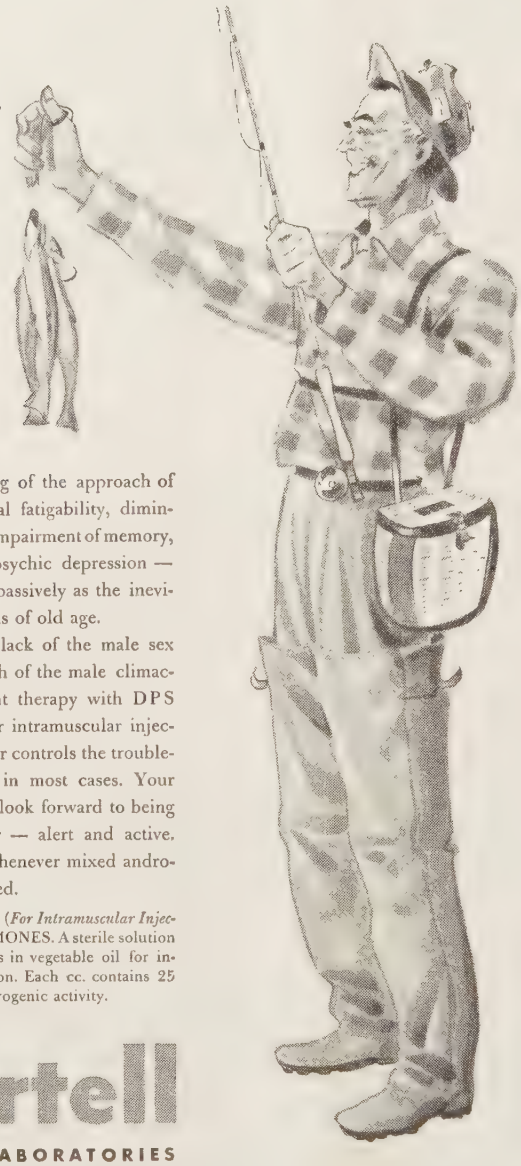

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Yale are severe cases of schizophrenia, a disease present in one out of every 200 persons in the population.

"Only those schizophrenics who have not reacted favorably to psychotherapy and shock treatment are considered for lobotomy," Redlich explained. "We operate only when we lose hope that any other procedure would help.

"Besides that, we operate on patients with very severe and chronic depressions who do not react well to other procedures. We have operated on a few patients with extreme compulsive-obsessive reactions and on occasional patients with chronic excessive pain. The operation does not abolish the mechanism of pain but rather enables the patient to live with his pain and not care so much."

The Yale psychiatrist stressed that lobotomy results achieved by the Connecticut project are *not solely the results of the operation.*

"Every lobotomized patient needs psychotherapy and the help of a social worker to adjust. Often the quality of the psychotherapy and social work will determine to a large degree how good the adjustment of the patient is going to be."

He described the operation as a "very drastic procedure" requiring not only clinical judgment but a "true humanitarian viewpoint."

"In each case we must ask ourselves the crucial question: Whether it is justified to expose the patient to an operation which may remove some of his very human qualities in order to alleviate his symptoms of mental illness."

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Dr. James L. Hymes, Jr., professor of education and coordinator of Early Childhood Education, State Teachers College, New Paltz, N. Y. advises parents that if they are sensitive to the young child's two major ambitions, for independence and security, they will not have much difficulty in finding the right way to help them.

In the new public affairs pamphlet, *Enjoy Your Child, Ages 1, 2 and 3*, the doctor uncovers the foundations for good human relations. They are built in a child's early years when he first seeks feelings of success, achievement, and confidence.

Wanting his own way, wanting to explore and discover are the one- two, and three-year-old's way of seeking power, power over himself, over people, and over things. The book further declares that parents need not be afraid, however, that this means that the child will grow up to be a brute. It means confidence in himself, a healthy sureness.

Dr. Hymes tells parents that they can try to meet their children's legitimate needs without fear of spoiling them. "Many children who are spoiled," he says, "got not too much of what they wanted, but too little.

"Severe disappointments or too many of them seem to block growth. The normal growth of other children is blocked in a different way. They are held and fondled, not when they want affection, but when the adult wants to give it to them."

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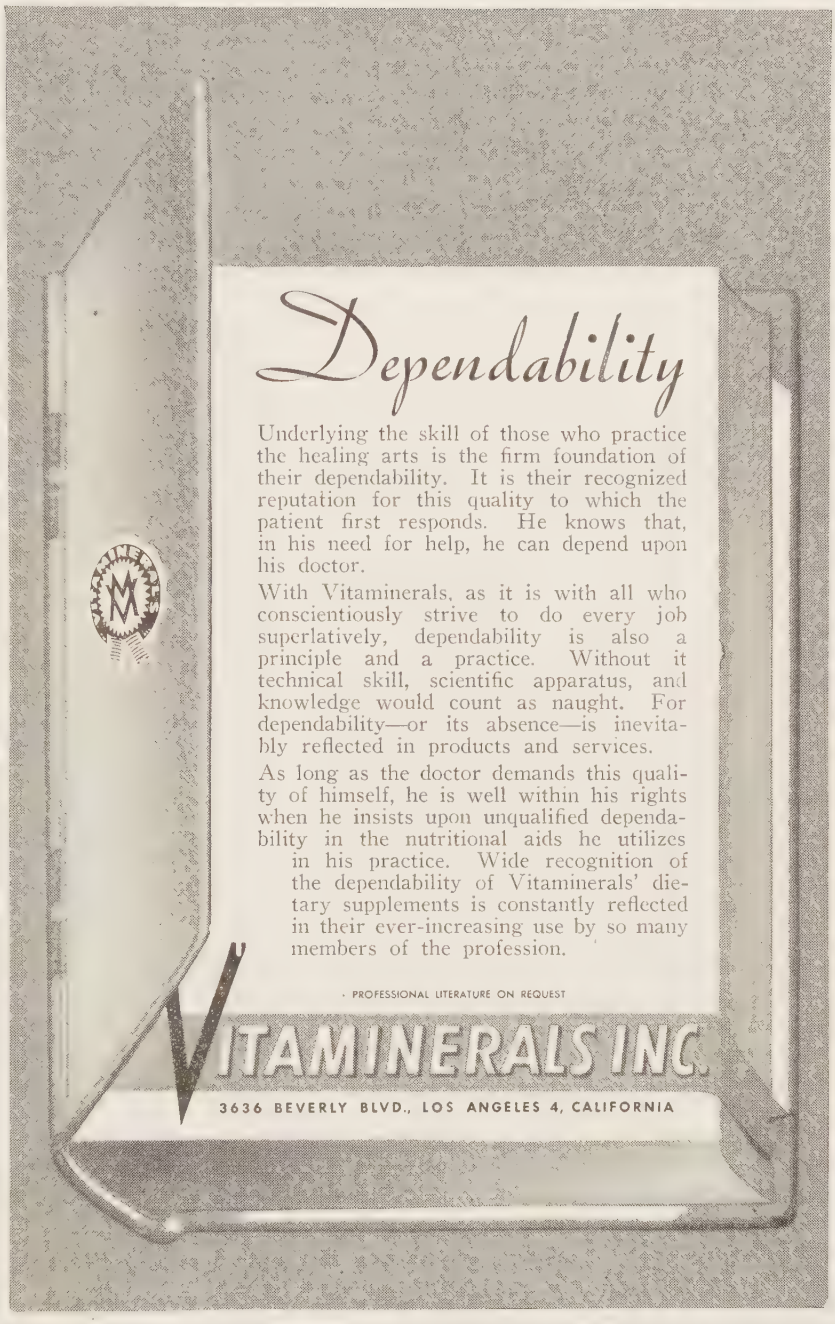
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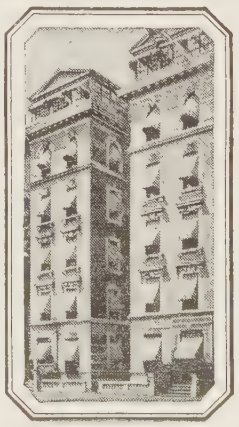

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CYTOLOGICAL DIAGNOSIS OF ABNORMAL GROWTH IN THE FEMALE PELVIS

FRANKLIN I. SHROYER, M. D.
Dayton, Ohio

The detection of neoplastic growth and the pre-growth of the female pelvis is the function of the cytology smears. Ayre, (1) of Montreal, reports two hundred and twenty cases diagnosed by smear and confirmed by biopsy out of two thousand cases examined. His average deviation in diagnosis between smear and biopsy was 2.96 percent.

Cytology was first developed by Dr. George Papanicolaou, (2) professor of anatomy, Cornell University. He was the first to recognize the strange like cells floating down in the vaginal secretions. His discovery opened up a great new field for cytology when he and Traut (3) published their article, "The Diagnosis of Uterine Cancer by the Vaginal Smear".

There are in the cervix some two hundred and fifty glands and ducts, and all the Mullerian ducts are lined with epithelium. Desquamation is characteristic of it, and through the physiological stream of the tubes, uterus, cervix and vagina pass the cells that are thrown off. The tumors arising in this, if malignant, are as a rule exfoliative. And it is known that exfoliation from these growths is much greater than from normal epithelium. So you will find from the moist friable surface a cancer lesion, the cells showing the morphology of malignancy.

Cytological smears can be taken in the office clinic, aspirated, and stained on slides and delay in diagnosis eliminated. It is this delay of weeks or months that means life or death.

Statistics indicate that eight months is usually the difference between the first signal of trouble and the accurate diagnosis of malignancy by biopsy. Often one cytology smear will confirm diagnosis of cancer while frequently a biopsy will miss the diagnosis. Meigs (4) reports excellent accuracy in cancer detection by vaginal smear. Ayre, (5) of Montreal at McGill, reports that early in his studies it became apparent that the cervical smear presented a greater concentration of cancer cells in the tenacious mucus at the cervical os. Thus the malignant cell was more rapidly isolated. He calls this cervical cytology a "surface biopsy". These cancer cells are cut off from the main body growth and are caught in the mucus smear.

We know well that the squamo-columnar junction in the region of the external cervical os is the site in which the cancer cell first develops. It is the exact zone in which squamous carcinoma of the cervix develops. It is possible to obtain a greater concentration of the desquamated cancer cells and these reveal the earliest cellular evidence of cancerous change.

"Precancer" is a term that is rapidly being displaced by secondary hyperplasia and early pre-invasive cancerous change. Cytologic studies have revealed evidence of abnormal endogenous estrogen in benign and malignant uterine tumors. Many endocrinologists and cytologists agree that the cornification cell count in vaginal and cervical cell smears is a simple assay.

Allen (6) has described the presence of estrogen in human and monkey vaginal smears by cornification of the cells accompanied by poliferation of the vaginal and cervical squamous epithelium. The vaginal epithelium in the postmenopausal female is made up of basal cells which contain no glycogen and cornification is not present.

But under the influence of abnormal estrogenic hormone, the dispostion of glycogen is often brought about and cornification of squamous cells occur.

The term "precancer" is a confusing one. Its significance cannot be adequately expressed by

any other term. The term "secondary hyperplasia" is used to designate a condition similar or in place of "precancer". These lesions are more than an erosion. We may see patients who complain only of a leukorrhea and whose cervices exhibit no clinical evidence of pathology other than a tiny circular reddened area about the external os, yet an expert cytologist will see many atypical squamous cells with an abnormal cornification level which is always or is a prediction of impending cancerous development. The picture will be:

1. Anaplastic squamous cells.

2. Atypical cornified cells showing dense nuclei.

3. Abnormally high cornification, a cell that is completely cornified has lost its nucleus and is horny like in structure.

4. Multi-nucleation.

Precancer in the clinical state should be differentiated from precancer in the pathological state.

Novak (7) defines precancer lesions of the cervix as, "Lesions that exhibit cell activity unusual in benign conditions and yet lack certain characteristics of actual cancer".

TeLinde and Galvin (8) say, "In many patients diagnosis of cancer is not possible from palpation or inspection of the cervix."

The vaginal and cervical smear is rapidly becoming established as a reliable and simple method of making a diagnosis of malignancy arising from the female generative organs, in the mouth, bladder, rectum and lungs.

TeLinde's report throws light on the course of the pre-invasive lesions when it was demonstrated that some cases will harbor the lesion for eight and a half years before the patient finally developed atypical invasive cancer.

At McGill, Ayre, (9) of Montreal, diagnosed many cases as precancerous or secondary hyperplasia and report many cases showed a minimal number of atypical suspicious looking hyperplastic cells which were considered insufficient evidence to cause the pathologist to alter the diagnosis of exudative cervicitis. Results indicate that atypical hyperplastic and anaplastic cells were developing in individuals manifesting abnormally high endogenous estrogen activity coupled with thiamine deficiency.

The cytology of erosion and precancer are distinctly different. Routine smears will detect the suspicious growths at an early preclinical, precancer stage, permitting easy cure by means of treatment at our disposal today. Some cases with a thiamine deficiency have revealed a biopsy showing a localized intra-epithelial cancer. It has always been a question in the minds of gynecologic cytologists how long such cases may remain non-invasive.

Routine cytology tests will spot an asymptomatic and pre-clinical cancer. So it seems logical that every woman should have a test once or twice a year as a prophylaxis.

The value of routine test can be summarized as:

1. Accurate diagnosis before the lesion becomes a spreading incurable cancer. Dr. W. A. G. Bauld, (10) of McGill, suggests that our five-year cure rate could be doubled by the proper application of the cytology test today.

2. A cytology test can be made in any physician's office; a biopsy is much more costly

3. A cytology test will tell you whether you have a benign erosion or an early cancer.

4. A cytology test should be part of a routine physical examination.

5. If a biopsy is done after a cytology diagnosis then at that time radium can be inserted.

6. During menopause the cytologic test will give immediate indication when irregular bleeding may be benign, or pre-malignant, or malignant.

7. Cytology avoids opening up the lymphatics or the spreading of infection.

Fifteen thousand women die annually in this country of uterine malignancy, six out of every hundred women with cancer of the cervix are totally inoperable when first seen by the gynecologist or surgeon. However, no method of diagnosis of uterine cancer is infallible. Even the biopsy not infrequently fails to include the area of carcinoma.

The vaginal smear as a method of diagnosis has certain definite advantages.

The ease of obtaining the specimen makes possible the testing of a large number of women.

The method is not expensive, and demands no special facilities.

The smear takes a fair sample of all the cells desquamated into the secretions.

It can establish a possible diagnosis in the very early cancer.

Diagnostic accuracy is high, near 97 percent of uterine cancer can be diagnosed accurately, more easily, and much earlier in the course of the disease than can be accomplished by the use of the older techniques.

It is ideal for testing large masses of the population.

Specimens are obtained with great ease, a nurse can be taught to take the smears. Diagnosis of smears is not an office procedure. The ability to make an accurate diagnosis comes only after weeks or months of training in one of the established laboratories. The slides are easily taken and prepared, and will keep for a week or longer and can be mailed to any cytology center for diagnosis.

There are three types of normal vaginal cells seen in the vaginal smear.

The basal cells are small, round, basophilic cells which come from the deepest layer of the vaginal mucosa, with large, active vesicular nucleus.

Large, basophilic, transparent cells with active nuclei, are pre-cornified cells which originate in the middle layer.

Cornified cells come from the superficial layer and are acidophilic transparent cells with pyknotic nuclei. Pyknotic cells are those with shrunken nuclei.

Endometrial cells are small, round, deeply staining nuclei, and have little cytoplasm.

Histiocytes; leucocytes, red blood cells; and bacteria are frequently present.

Malignant cells have a nuclei which is hyperchromatic, the nuclei vary tremendously in size. There is almost no cytoplasm present in indifferentiated malignant cells.

The differentiates malignant cells have hyperchromatic nuclei varying in size and assume bizarre shapes, such as "tadpole cell" and "fiber cell".

The vaginal smear method is a valuable assistant to biopsy and with the use of both methods together will increase the effectiveness of early malignant diagnosis.

Cytology or vaginal smear has been in continuous use in the Woman's Clinic (11) at Cornell University, New York Hospital, for three years.

Of 2,320 cases reported by Ayre, the average percentage of error was 2,96 percent. Cytology has been found to be an aid in the diagnosis of pregnancy, ovulation, amenorrhea, abortion, ectopic gestation, and menopause, all of which are interesting phases of gynecology.

A new milestone has been reached in the diagnosis and control of gynecologic cancer. Cytology will disclose cancer cells present in the vaginal smear if sufficient radiation has not been used to kill out the cancerous growth, and an excellent aid in determining further treatment of cervical and uterine cancer.

The clinical appearance of the cervix is not true indication of early neoplastic growth change; early cancer is often symptomless cancer.

Clinically recognizable cervical cancer is usually advanced incurable cancer.

The discovery by the cytology test of cancer and the precancerous cell change of the pre-invasive cancer or the precancerous type occuring in the normally appearing cervices in many women, suggests the possibility of such non-invasive lesions being present for many months or years before developing into invading carcinoma.

These cell changes are only recognizable by the microscope; by the cytology test; and by biopsy.

There is often no indication to call for a biopsy. Many, however, were diagnosed previously by vaginal smear as a positive cancer.

As it is illogical to suggest biopsing all cervices of normal appearance, or otherwise, only by the cytology test were they detected by this simple means.

This adequately protects the female patient from this type of cancer; cytology test should be taken routinely on every woman once or twice yearly.

While the cytology test has revealed pre or non-invasive cancer in normal appearing cervices, conversely clinical suspicion has been centered around the totally eroded, lacerated, and infected cervices which often appear malignant. Yet cytology confirmed by biopsy verify absence of non-plastic growths. Therefore, in early cancer the clinical appearance cloaks the microscopic picture while directing suspicion to the mounting erosion.

Cytology represents a new mile stone in the control and prevention of uterine and cervical cancer; Ayre, McGill (13).

Cytology is a highly specialized service requiring:

1. Precision in the technique of taking a test.
2. Precision and skill in the specialized staining.
3. Experience and skillful judgment in their interpretation by an expert cytologist.

Failure in any of these departments might nullify or impair the accuracy of the results, these requirements place within our reach the most valuable instrument to combat mortality in this type of cancer since the discovery of radium.

As stated, in 2,320 cases the average deviation between cytology and biopsy was 2.96 percent. Cytology diagnosed cancer before there was any indication to do a biopsy. This scientific contribution is of enormous value in the field of the prevention of cancer. Ayre and associates at McGill, (14) state that cervical cytology smear will differentiate over 95 percent of the cases.

"Precancer" is a cytopathological designation signifying cervical squamous cell change of the hyperplastic or anaplastic type without invasiveness. Precancer, therefore, includes such lesions as have been described as; "Bowen's disease"; "Carcinoma in situ;" "Intra-epithelial cancer;" "Carcinoid secondary squamous hyperplasia." "Intra-epithelial hyperplasia." Temide H. Taylor says; "That such lesions do become invasive but in some cases after prolonged interval-one to eight years." Indirectly, that invasion type is strongly transitional, and is slowly developing into terminal invasive stage.

No doubt the routine cytology test will lead to a physical check up which may be the means of spotting a disorder locally or elsewhere while in its incipient stage.

The time is here, or fast approaching when every physician will make, or should make, a vaginal smear and have same interpretated by a cytology laboratory.

In actual practice, the vaginal smear revealed the presence of practically all the malignant lesions of the cervix which could be detected either clinically or by the use of a biopsy. In addition, it has revealed a group of early lesions which could not be seen, and hence, could not be subjected to tissue diagnosis. Some of these were at the squamo-columnar junction, while others were hidden in the cervical canal.

The vaginal smear is the only practical method thus far developed which is useful in revealing the very early carcinomatous process, particularly those of the cervix. It also offers an ideal method of approach to a problem which has been neglected for want of a method. The biopsy and tissue method of diagnosis is not applicable to the borderline cases, because the many samples required to gain data and because of the considerable periods of time wasted in reaching an accurate diagnosis.

Adenocarcinoma of the uterus will exfoliate cells into the vagina, and cytology will detect them. Malignant growths of the ovary and tubes can also be detected, growths of the bladder and rectum will exfoliate as well.

If a patient has had a super-vaginal hysterectomy for myoma, a vaginal smear should be made to check on the cervical stump for possible cancer or secondary hyperplasia, thus preventing a cancerous death within six months or a year later, which happens too frequently.

Cytology will be available to every doctor and the smear can be made during routine examination, and as easily as taking the blood pressure.

The staining technique can be learned by any competent nurse, and the slide diagnosis can be made by any competent cytologist. The method of staining and the mounting of the slides is as follows:

1. Aspirate secretions from the vagina and the external cervical os, and from the cervical canal with a glass pipette. Scrape the squamo-columnar junction with the wooden spatula, just where the membrane from the outer cervical wall and the inner canal meet. The aspirated secretions and the scrapings are spread evenly on separate slides, one marked "O" the other marked "S". Following preparation of the smear or spread, it is immediately immersed in the solution containing equal parts 95 percent alcohol and ether. The slides are then left immersed in this solution for one hour.

2. The smears may be temporarily mounted with glycerine to facilitate mailing. This is done as follows:

After standing in the fixation for one hour, a large drop of glycerine is placed in the center of the secretion zone. A second glass slide is placed over this sealing it off completely. The slide may remain in this temporary glycerine mounting for two weeks, but the best staining results will be obtained if this does not exceed one week. This permits mailing to any cytology laboratory.

3. Staining procedure; this is carried out in the cytology laboratory. The coverslide is removed by rotating one slide on the other slightly preceding separation. The slide containing the cell smear is then placed in absolute alcohol for five minutes to allow the glycerine to dissolve, then staining is as follows:

(1) Wash is 70 then 50 percent alcohol, then rinse well in two changes of distilled water.

(2) Stain in Harris Hematoxylin for 6 to 10 minutes, depending on the condition of the stain, older stain requires more time. Change stain every two weeks.

(3) Rinse thoroughly in 0.5 percent aqueous solution Hcl then wash in tap water.

(4) Rinse in lithium carbonate (saturated solution) till blue.

(5) Rinse in running tap water (cold) for 10 to 15 minutes for routine staining. If time is a factor, 5 to 10 minutes is long enough.

(6) Rinse in distilled water.

(7) Then in 50 percent; 70 percent; and 80 percent alcohols, one rinse each.

(8) Rinse in two changes of 95 percent alcohols.

(9) Stain in Pap. OG 6 for 2½ to 3 minutes, depending on age of stain.

(10) Rinse 3 to 5 times in each of two 95 percent alcohols.

(11) Stain in Pap. EA 50 for 3 to 5 minutes.

(12) Rinse 3 to 5 times in each of three 95 percent alcohols.

(13) Rinse once in absolute alcohol.

(14) Then in two changes of Xylol.

(15) Mount in Canada Balsam, Clorite, or Permount.

Slides are then examined and placed in a double fold paste board container and mailed to any cytology laboratory in the United States or Canada for interpretation. A pathologist should become an expert cytologist, but one does not have to be a pathologist to become an expert cytologist. Many trained technicians in cytology do not attempt to diagnose a biopsy, they leave that to the trained pathologist.

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WHY THE HYSTERECTOMY?

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As an outgrowth of the advance in the practice of medicine and surgery there is in our modern hospitals closer scrutiny and review of many procedures which previously were performed without restraint or reason. This improved attitude has been the result of better professional knowledge and understanding of disease processes, improved education by our medical schools, more graduate training and better hospital standardization and requirements by the American Medical Association and the American College of Surgeons.

For instance, in our community each larger hospital now demands a consultation by a competent obstetrician for every Cesarean section performed. This consultation is free of cost both to the patient and the physician and each case must fulfill the indication for the section before the operation is allowed. This, we believe, improves the level of obstetrics done in this community by giving expert opinion for those needing operative delivery and also by preventing a few unnecessary sections. These consultations really elevate the public's opinion of the physician. The patient and her family more solidly feel that the proposed operation is just and indicated. The list of consultants here is felt to be adequate only when it includes men active on the hospital staff who are American Board Diplomates, Fellows of the American College of Surgeons or those seasoned by years of alert obstetrical practice.

Perhaps we should now direct our attention to the commonest major gynecological procedure and review some of the indications for the hysterectomy.

The Indications for Hysterectomy

The indications for the hysterectomy can be divided into malignant, benign, and obstetrical causes for the operation. It is not the object of this paper to recommend that the hysterectomy is the procedure choice for each disease process named but we are searching for an excuse for every uterus removed. If our search fails to find a good honest reason for the hysterectomy then we should claim that the procedure is contraindicated and the uterus would have better been left in place.

Malignant

A malignancy of the uterus offers the strongest indication for its removal and this operation should be total in type including the cervix, tubes and ovaries with wide margin excision.

Adenocarcinoma of the uterine fundus is treated by total removal of the uterus, tubes and ovaries—either alone but preferably in conjunction with x-ray and radium treatment. The operator is properly allowed variation in his schedule of attack on this type of malignancy based upon his experiences and the individual case at hand. However, the surgical approach is inadequate if it includes less than the whole uterus, ovaries and tubes.

Sarcoma of the uterus is treated by a similar operation. This disease process is often unsuspected but rather discovered in the routine examination of the uterus removed for fibroid or other tumors. Novak (1) in his laboratory observed that sarcoma in 4.5 percent of uterine malignancies and he emphasized the fact that the diagnosis often is not made until operation.

The malignant polyp of the uterus is treated in the same manner as an adenocarcinoma of the uterine fundus and the same procedure may possibly be used for a malignant polyp of the endocervix. However, a larger number of the malignancies of the endocervix are better treated by x-ray and radium in the manner of a treatment of a squamous carcinoma of the cervix. The method of management can possibly be influenced by the extent of the disease and the availability of deep x-ray and radium equipment to the profession.

Carcinoma of the ovary and fallopian tube are best treated by complete removal of the malignancy along with the uterus and regional lymph node with surrounding tissues. X-ray may be of value as a postoperative adjunct depending upon the cellular cystology of the tumor and its tissue extension.

Often in the course of excision of malignancies of the bowel, bladder, bone and other pelvic supportive tissues it is necessary to remove the uterus for better exposure, actual metastatic extension to the genitalia or potential metastasis to the pelvic lymphatic.

The carcinoma in situ, carcinoid and persistent hyperplasia and metaplasia of the cervix and endocervix may be reasons for a total hysterectomy because of their grave actual or potential dangers to the patient. Here again the individual evaluation of these problems is imperative and operation should be weighed against the use of radium and possibly deep x-ray radiation.

The recent enthusiasm of Meigs (2) for the Wertheim operation for carcinoma of the cervix should not shield from us the advances and advantages of x-ray and radium in this disease process. In usual gynecological hands the Wertheim operation is rarely if ever indicated and even the narrow indications as outlined by Meigs will not allow as many of these major procedures as endorsed by Taussig in past years.

*Presented at the fall meeting of the Washington State Obstetrical Society, Tacoma, Washington, October 11, 1947.

Benign

Leading the field for benign indications for a hysterectomy are the leiomyomata. The abnormal bleeding, pressure, presence of a tumor and pain manifest in these patients may lead the woman to the surgery. However, seedling and small fibroids may be sometimes watched, particularly if these are not associated with rapid growth or abnormal bleeding. Most of these observation cases deserve and should receive a diagnostic currettage. It is rather surprising the number of uteri with intramural fibroids and menometrorrhagia which have a remedied cycle of flow following a curettage. The myomectomy should not be forgotten for a few younger women who are short on tumors and long on a desire for future pregnancy .

Adenomyosis and multiple endometrial implants on the uterus offer indications for the excision of the uterus. The same is true of tuberculosis and actinomycosis of the cervix, endometrium, and internal genitalia.

Second to third degree symptom prolapse of the uterus which is usually associated with bladder and rectal prolapse offers indication for vaginal hysterectomy and repair of the bladder and rectal herniae or vaginal repair with abdominal hysterectomy. The Manchester and interposition operations may serve as cure to some of these prolapse problems.

Chronic infections of the endometrium, myometrium and adnexae occasionally need pelvic housecleaning to affect a cure. Under the present regime of chemotherapy and nonsurgical management of these problems, we observe fewer of the meddling salpingectomies and oophorectomies If the woman fails to respond to several months of conservative therapy of rest, local heat, foreign protein, penicillin and general supportive measures then operation is considered. Complete excision of the tubes, ovaries, and uterus seems to offer less troubles for the woman's future Much of the improvement of pelvic inflammatory disease treated in this surgical manner is undoubtedly due to the sexual sterilization. Leaving ovarian remnants behind may account for the surgical failures sometimes seen.

A few of the persistent functional bleeders who fail to respond to the usual course of curettage, hormones, x-ray and uterine radium may be treated by a hysterectomy. This is only considered, however, after a study of the patient's previous therapy, her age, and the clinical condition of the patient generally and specifically regarding her vaginal hemorrhage. The same applies to problems of severe dysmenorrhea although hysterectomy indications are even more narrow here as we observe better responses from other measures. The presacral sympathectomy offers far less disturbance of pelvic functions in these women who so commonly are emotionally unstable and poor candidates for uterine removal.

Unusually a spontaneous or traumatic hematomata of the broad ligament or instrument penetration of the uterus may give reason for a hysterectomy. Even less commonly a hemangioma of the uterus may indicate the procedure.

A few congenital lesions of the uterus such as double uterus or bicornuate uterus may rarely need surgical correction for pregnancy, pressure symptoms or other reasons.

The difficult rectovaginal and vesicovaginal fistulae situated high in the vagina sometimes need abdominal hysterectomy for exposure or adequate collapse and excision of the sinus tract. In a few cases where the bladder or rectum have been functionally impaired by a previous operation or infection of the internal genitalia, it may be necessary to remove the uterus to affect a cure. This is not uncommonly seen after a poorly done interposition operation where the bladder is bound down and has a marked decrease in capacity.

Whenever bilateral excision of the tubes and ovaries becomes necessary, there is no sound reason to leave the uterus which can serve no menstrual or reproductive functions. If the uterus is left in these circumstances, there may be subsequent uterine prolapse, flexion displacements, new growth or infection and therefore it is personally felt that the uterus is best removed along with the tubes and ovaries.

Obstetrical

In obstetrics we see only occasional indication for the hysterectomy. Here again the main reason for the excision of the uterus is a uterine malignancy such as chorionepithelioma and adenocarcinoma of the uterine fundus. Cure of an ovarian or tubal carcinoma during a pregnancy may also indicate the removal of the uterus. The Porro type section hysterectomy for intrauterine infection and uterine tumors is sometimes in order as is hysterectomy for the Couvelaire uterus and placenta accreta.

Uterine rupture is a true indication for excision of the uterus and we less commonly see persistent severe subinvolution treated in a like manner.

Inversion of the uterus may sometimes only be cured by a vaginal or abdominal hysterectomy. Quite uncommonly one sees torsion of the pregnant uterus with necrosis which is relieved only by removal of the uterus.

Contraindications

It is claimed that any uterus which is not and can not be added to the above indications by sound reason should be left in the pelvis. The normal uterus which is free of actual tumor, regional disease or prolapse should not be excised any more readily than a finger, an eye, or yes, even a normal testicle.

The atrophic uterus, *fibrosis uteri* and the uterus with small asymtomatic fibroymata uteri can be left in place.

An ectopic pregnancy does not indicate uterine removal except in very unusual conditions.

The older method of an abdominal hysterectomy alone to correct cystocele and rectocele is no longer in vogue.

Endometrial polyps and extruded submucous fibroids are better handled by vaginal route with excision only of the diseased tissue unless these conditions are recurrent or are found in conjunction with other disease indicating a hysterectomy.

Carcinoma of the cervix except in very unusual circumstances and in very unusual hands is better treated by x-ray and radium in appropriate doses. The overall salvage by radiation is good and we can expect a brighter future with better machinery and improved techniques. A pelvis hopelessly invaded with carcinoma of any type is best left alone except for efforts to relieve pain and obstruction.

Sterilization of the female need not be done by removal of the uterus as a tubal ligation or excision are a lesser procedures accomplishing the same result with less functional disturbances and pelvic distortions. The female may be sterilized by x-ray and radium in selected problems particularly the premenapausal group.

Pregnancy and pregnancy product retention where the removal is in order are judiciously managed vaginally or under certain conditions by abdominal hysterotomy. Only under the most unusual circumstances would hysterectomy be in line for the removal of an early pregnancy.

Hospital "X"

Using this outline of indications and contraindications for the hysterectomy I approached the pathologist in one of our metropolitan hospitals, which we will call Hospital "X", for the hysterectomy details of the year 1946. In addition to some pointed remarks he classified the 187 uteri removed as to the predominant disease (or lack of disease) and we divided these as indicated or contraindicated procedures as below.

Malignant

1. Adenocarcinoma of the uterine fundus.
2. Sarcoma of the uterus.
3. Malignant polyp of the uterus and endocervix.
4. Carcinoma of the fallopian tube and ovary.
5. Metastatic extension for other pelvic malignancies—bowel, bladder, bone and supportive tissues.
6. Persistant hyperplasia and metaplasia of the cervix and endocervix—carcinoid—carcinoma in situ.

Benign

1. Leiomyomata uteri.
2. Adenomyosis and endometrial implants.
3. Tuberculosis or actiomycosis of the cervix, endometrium and internal genitalia.
4. Uterine prolapse.
5. Removal of both ovaries and tubes.
6. Resistant infections of the uterus (endometritis and myometritis).
7. Resistant infections of the adenesal (pelvic inflammatory disease.)
8. Severe and persistant menorrhagia.
9. Severe and persistant dysmenorrhea.
10. Hematomata of the broad ligaments.
11. Congenital lesions—double uterus, biconuate uterus, etc.
12. Instrument penetration uterus with bleeding.
13. Hemangioma of uterus.
14. High rectovaginal and visicovaginal fistulae.
15. Impaired bladder and rectal function from fixed uterus.

Obstetrical Indications for the Hysterectomy

1. Chorionepithelioma and adenocarcinoma of uterus.
2. Ovarian and tubal carcinoma.
3. Infected section or fibroid uterus. (Porro).
4. Couvelaire uterus (uterine apoplexy).
5. Placenta accreta.
6. Uterine rupture.
7. Subinvolution (persistent).
8. Inversion of the uterus.
9. Torsion of pregnant uterus with degeneration.
10. Tumor of the pregnant uterus with hemorrhage and/or subinvolution.

Contraindications for the Hysterectomy

1. Normal uterus.
2. Fibrosis of the uterus.
3. Small asymptomatic fibromyomata uteri.
4. Ectopic pregnancy.
5. Abdominal excision of the uterus to repair cystocele or rectocele.
6. Endometrial polyps.
7. Extruded submucous fibroids.
8. Carcinoma of the cervix.
9. Hopeless carcinoma of the uterus or pelvic viscera.
10. Sterilization.

Table I

Hospital "X" Hysterectomies 1946 187 Cases

	Cases	Percent	Indication	Contraindication
1. Leiomyomata	80	42	80	
2. Leiomyomata shelled out	17	9	17	
3. Chronic hyperplasia endometrium	24	12	24*	
4. Fibrosis	19	10		19
5. Polyp	17	9		17
6. Carcinoma	10	5	10	
7. Normal	6	3		3
8. Atrophic	3	1.5		3
9. Adenomyosis	3	1.5	3	
10. Endometriosis	2	1	1	
11. Adenoma	2	1	1	
12. Tuberculosis	1		1	
13. Subinvolution	1		1	
14. Placenta	1			1
15. Myxosarcoma Authors note *	1		1	
Total	187		141	46
Percent	100%		76%	24%

* Likely over one half of these belong rightfully in the contraindication column. This would even make an even worse situation.

During the same period of time only 68 curettages were performed in this hospital.

Norman F. Miller (3) in a study of 246 hysterectomies in ten midwestern hospitals reports that in 33.1 percent of these cases there was no disease and actually a contraindication for hysterectomy.

In Dr. Miller's and in the present report there is some variation as to the pathology of the organs removed but the conclusions are similar. There are too many hysterectomies done which are contraindicated. This thoughtless attitude is a hazard not only to our patients but also to our profession.

It would appear therefore that we need a closer study of our indications for the hysterectomy and perhaps a freer use of the curette and other less radical agents for uterine dysfunction.

A continued poor record in our hospitals can only mean—fee or fumble. Perhaps we may even need here a hysterectomy consultation schedule similar to that in effect in Seattle for Caesarean sections for all of our hospitals.

Summary And Conclusions

1. The malignant, benign and obstetrical indications for a hysterectomy are outlined and discussed.

2. A review of 187 hysterectomies performed in 1946 in hospital "X" is presented and these operations are classified as indicated (76 percent) or contraindicated (24 percent).

3. Too many contraindicated hysterectomies are done. This is a hazard to our patients and our profession. This should be corrected. Perhaps, consultations should be required on each hysterectomy performed.

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A NOTE ON THE DEPRESSION OF BLOOD CHOLINESTERASE LEVEL FOLLOWING X-RAY THERAPY AND ITS BEARING ON THE MECHANISM OF RADIATION SICKNESS

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Glenn and Reeves (1) have recently reported the salubrious effects of trasentin and trasentin-phenobarbital in radiation sickness. They state that they were led to its trial through a review of the theories on the pathodynamics of the condition and by Wallace's (2) observation of intestinal and sphincter spasm after radiation.

Diarrhea, which was evidenced by twelve of their 31 cases, is a sign of intestinal hypermotility and this in turn is a manifestation of cholinergic (parasympathetic) activity. (3)

Trasentin, being a parasympatholytic drug, would be expected to abolish the effects of such activity. The effectiveness of trasentin could thus be construed as evidence for the cholinergic nature of this phase, at least, of radiation sickness. That in radiation sickness we are in fact dealing with a cholinergic state became apparent during some recent studies on patients with malignant leukoblastosis. (4)

Following x-ray therapy in four subjects, the whole blood cholinesterase level (ChE_b) as determined twenty four hours later, had fallen from its previous, pre-radiation level. Though the effect of radiation had not been germane to our study and the fall in ChE_b noted incidentally, its degree exceeded the limitations of experimental error of the method of determination (5) and is considered significant both from a theoretic and a practical standpoint. In four patients with chronic lymphatic leukemia (in which ChE_b is not ordinarily initially depressed (4), reductions of from 0.23 to 0.84 Alles and Hawes (5) units were observed. Similar reductions have been noted after irradiation for lymphogranulomatosis. (6) These reductions, which had constituted from approximately 5 to 20 percent of the total ChE_b, had not been considered as a sufficient factor to condition a cholinergic state until an opposite conclusion was forced upon us by a series of recent and seemingly unrelated observations.

Through the investigations of Sabine (7) it has been known since 1940 that the erythropoeitic marrow is the origin of ChE_b but the intrinsically important role of that enzyme in combatting cholinergic states only became apparent with the recent demonstration by Davis (8) of the constant presence of acetylcholine, the parasympathetic mediator,

(From the Laboratory Service of the Halloran General Hospital, Staten Island, N. Y.)

in the blood of humans. When ChE_b diminishes, the blood acetylcholine concentration rises reciprocally and if the rise is sufficient, a cholinergic state results. This can take a variety of forms in the human; (a) epileptoid-syncopic, (b) atopic exudative or (c) fibrillary-pyrogenic-tetanic depending on the constitutional predisposition of the reactor. Malaise is a manifestation of all forms and gastrointestinal hypermotility is a feature of (b).

Glenn and Reeves (1) mention the possibility of psychic factors in the genesis of radiation sickness and there is no doubt that the blood acetylcholine level can be augmented by emotional and psychic factors. (9) Psychic disturbances can initiate any one of the three forms of cholinergic reaction though it usually acts as a supplement to some other cholinergic episode. (10) The same is true of vitamin deficiency; pyrodoxine deficiency particularly could potentiate radiation sickness since such deficiency causes porphyrin lacrymation (spectacle eye) in the rat and this is definitely a cholinergic state (11, 12).

The estrapenic (ChE_b reducing) effect of radiation is of considerable interest aside from its possible role in the production of the cholinergic manifestations of radiation sickness. The lowest ChE_b values found in the human are in instances of the malignant hematologic dyscrasias; the marked estrapenia, *per se*, is believed to be responsible for the profound cholinergic intoxication symptomologically expressed by these patients.

Thrombocytopenic purpura is an "atopic-exudative" form of cholinergic state and the terminating modality in most cases of acute leucosis (4). Again this is believed due to a failure of ChE_b synthesis by an exhausted marrow. The theoretic objection to radiation therapy in the acute leucoses lies in the ChE_b depressing effect of such therapy which would make the cholinergic intoxication even worse. This reasoning is borne out by the adverse effect which x-ray actually has in patients with acute malignant hematologic dyscrasias.

It is likewise possible that the estrapenic effect of radiant energy is responsible for the purpuric terminus of the delayed reaction cases which followed the mass human experiments of Hiroshima and Nagasaki. While comparable doses would hardly ever be approximately therapeutically, there has been noticed a marked variation in the sensitivity of the ChE_b replenishing mechanism in different individuals to estrapenic agents.

This, like the type of response to a cholinergic episode, appears to be a matter of constitutional habitus or predisposition. An attempt to establish the ChE_b determination as a more sensitive criterion for overexposure of radiation laboratorians than either bone marrow cytological studies or the customary peripheral blood counts, is under way.

The ability of radiation to depress the bone marrow and thus lead to primary estrapenia yields an explanation of the genesis of radiation leukemia. According to a recently advanced concept (13) the malignant leukoblastoses are in reality reactions of a depressed and exhausted, rather than a stimulated or exalted, bone marrow.

Due to reduction in ChE_b, blood acetylcholine is markedly elevated. The bone marrow attempts to counteract the cholinergic state by the elaboration of ChE_b, but due to its (the marrow's) depleted condition and malfunction, succeeds only in producing undifferentiated leucocytes. The latter are entirely devoid of cholinesterase activity (7). Thus the morphologic picture, which has always appeared to be that of a marrow hyperactivity, is paradoxical and misleading. It has resulted in the evolution of a series of treatments for the acute leucoses utilizing marrow depressants (benzol, P^{32}, nitrogen mustards, thiouracil) all of which are therapeutically falacious because one is dealing with an already depressed marrow.

Evidence for the newer point of view lies not only in the complete therapeutic failure of such agents in the *acute* leucoses but also in the fact that they are actually inimical to the course of the disease.

Acute leukemia is frequently precipitated by a "cholinergic episode". The latter is a term used for a medical or surgical event likely to be followed by one of the three forms of cholinergic reaction (vida supra) in a susceptible individual. An emotional crisis (14), typhoid vaccine administration to a sensitized subject (10), acute infection or trauma and oral surgical manipulation (13) are all examples of possible cholinergic episodes and all have been followed in instances by acute leukoblastosis or other profound cholinergic state. It is possible that radiation will have to be included among the list of cholinergic episodes.

Summary and Conclusions

X-ray therapy is followed by a reduction in blood cholinesterase concentration. This change affords an explanation of the cholinergic symptoms of radiation sickness.

Because of its estrapenic effect, irradiation may be classified among the possible cholinergic episodes and may evoke a cholinergic reaction or state in susceptible individuals. Leukemia following intensive or protracted radiation may be on this basis.

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565 First Street

TREATMENT OF HYPOTHYROID OBESITY WITH THYROBROM

Based on a Series of 140 Cases

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The prevalence of obesity and the difficulties encountered in its management present a clinical problem. It has been conservatively estimated that one out of every five adults in the United States is overweight. The majority of these patients do not respond satisfactorily to dietary restriction alone. Hence any progress towards a practical solution is welcomed by the profession.

The present paper describes the satisfactory and successful use of thyrobrom (brominated thyroid, prepared by controlled chemical reaction between desiccated thyroid and bromine) in reducing excessive weight due to thyroid hypofunction in a series of 140 cases.

As will be shown by the clinical analysis, there was an average weight loss of 14 pounds over the period of the first three months and of 23 pounds after six months of thyrobrom therapy. The weight loss in this series of cases of hypothyroid obesity treated with thyrobrom averaged approximately four pounds per month. This is generally considered to be a desirable result from the standpoint of gradual return to normal weight. Serious untoward effects were not observed with thyrobrom medication.

Use of Thyroid in Hypothyroidism

The connection between symptoms of hypothyroidism and thyroid lack was established by Kocher (1) in 1883. Murray (2) almost immediately thereafter used thyroid extract in treating patients with hypothyroidism, while Fox (3) and Mackenzie (4) independently discovered its value. Magnus-Levy (5) demonstrated the effect of thyroid on the metabolic rate in 1895 and Kendall (6) in 1915 isolated a pure crystalline substance (thyroxine). Harington, (7) in 1926, determined the structure of thyroxine and, with Barger, (8) in 1927 synthesized it by combining two molecules of diiodotyrosine.

Since 1927, many other investigators have contributed to the knowledge of thyroid products and their therapeutic application. It is believed that brominated thyroid, thyrobrom, represents an important addition to the therapeutic armamentarium, especially in cases of hypothyroid obesity.

Development of Thyrobrom

The search for a therapeutic agent as effective as thyroid and with a minimum of toxicity finally led to the development of thyrobrom.

Thyrobrom, a brominated form of desiccated thyroid, acts chiefly through the organic compound (thyroglobulin) of iodine contained in it. In addition, the brominated thyroid possesses compounds of bromine, including protein molecules into which bromine has been introduced.

On chemical analysis, the iodine content of thyrobrom is identical with that of thyroid U. S. P. Its distinguishing chemical characteristic is the presence of bromine in the amount of two percent calculated as total bromine content. Approximately 0.04 percent of bromine is combined by addition in the thyroxine ring, 0.05 percent as a complex protein salt and the remaining 1.91 percent is combined with inert protein and as sodium bromide.

Thus, in addition to thyroid activity, thyrobrom also provides sedative effect by reason of its bromine-containing molecules. This is probably responsible for the low incidence of toxic reactions following thyrobrom therapy. Thyrobrom is indicated in all conditions for which thyroid U. S. P. is used including hypothyroid obesity.

Incidence of Obesity

The percentage of definitely obese persons seen in clinical practice is very large (Barre). (9) It has been estimated that one out of every five adults in the United States is overweight (Carey). (10)

"Obesity is one of the commonest ailments to which the flesh is heir," says Means, (11) "and is of importance to the individual in proportion to its degree and its association with other diseases. To the community it is of importance in that it may *per se* decrease human efficiency and shorten human life. The latter is proved conclusively by the data of life insurance companies."

In a recent study, the complications associated with obesity were determined in a group of overweight subjects (Danowski and Winkler). (12) They found an unusually high incidence of varicose veins, joint symptoms of knee and ankle, and hypertensive cardiovascular disease in such patients. Diseases of the cardiovascular system are found most frequently in overweight patients of all age groups. Mortality from circulatory diseases is two and one-half times as great in the obese as in individuals of normal weight (Preble). (13)

Obesity also is a predisposing factor in hyperglycemia as well as in hypertension (Musser and Wright). (14) Prolonged obesity causes changes in human metabolism (Ogilvie). (15) One of these changes is delayed utilization of carbohydrates with resultant hyperglycemia.

Diabetes mellitus and diseases of the gallbladder may be a complication of obesity. Lowered resistance to infectious disease, increased surgical risk and actual physical discomfort go hand in hand with excessive weight.

Table 1

PHYSICAL AND CHEMICAL PROPERTIES OF THYROBROM (BROMINATED THYROID)

Description	Amorphous powder, light brown in color, having a sweet ester odor like that of chlorophyl.
Iodine	0.20 - 0.24 percent
Nitrogen	7.26 mg. percent
Bromine	2.0 percent
As total Br. content	
As complex protein salt	0.05 percent
Combined by addition in thyroxine ring	0.04 percent
Combined with inert protein and as NaBr	1.91 percent

Diagnosis

Success of treatment depends upon evaluation of the cause of the obesity, whether it is due to endocrine factors or to excessive food intake or lack of exercise. Thyrogenous obesity is much more widespread than is generally thought. It must be emphasized that diagnosis should not depend solely upon the low basal metabolic rate which is characteristic of the sluggish thyroid.

Many cases of obesity are not of the classic type, yet are still of thyroid origin. They may have basal metabolic rates that are normal or even higher than normal. Hypothyroidism is a common condition which may not be readily recognized (Lee). (16) Obesity may be the only symptom.

Serum cholesterol determinations may be helpful, since elevated levels frequently accompany hypothyroid states. Other evidences of hypothyroidism are dryness and pallor of the skin, brittleness of the hair, slow pulse and general lethargy.

Symptomatic response to thyroid is generally considered the best indication for its use in borderline cases. This is aptly described by Werner (17): "The more the obesity is the result of hypothyroidism, the more spectacular will be the desired response or reduction of weight."

Clinical Study

To determine the value of thyrobrom in controlling excessive weight and associated symptoms, a study of 140 patients diagnosed as hypothyroid obesity was undertaken.

The initial investigation included physical examination, determination of basal metabolic rate and weight. Special attention was given to symptoms of nervousness, palpitation and pulse rate. The patient was maintained throughout the observation period on the same diet which he used prior to medication, which in all cases was a limited dietary. The patients were reexamined monthly, at which time weight and basal metabolism were recorded.

Of the 140 patients, 39 were male and 101 female, ranging in age from 9 to 36, the average age being 30 years. The average height of the group was 64 inches; weight before treatment 188 pounds. The average basal metabolic rate was plus 4; average pulse rate 77.

Thyrobrom was given in various dose ranges, the average being approximately 4 grains daily. The entire group received this medication for three months. It was found most desirable to administer the thyrobrom as a single dose in the morning so as to avoid insomnia.

Twenty of the group were continued under the same treatment for an additional three months. The average weight before medication was 193 pounds and initial basal metabolic rate was plus 1. The average dose of thyrobrom for these patients was 2¾ grains daily.

Weight Loss Following Thyrobrom Therapy

The average weight loss after three months' use of thyrobrom in the entire series of cases was 14 pounds. This may be averaged as a weight loss of approximately 4½ pounds per patient per month.

The average weight loss in the twenty patients who continued treatment was 23 pounds after six months of thyrobrom therapy or an average weight loss of approximately 4 pounds per patient per month.

No Toxicity

The average basal metabolic rate for the entire series of cases following three months of treatment was plus 19, which was an increase of 15. The average basal metabolic rate for the group of 20 was plus 6 after six months of thyrobrom therapy, an increase of 5.

The pulse rate after treatment averaged 81 per minute, which was an increase of 4 over the initial pulse rate taken prior to medication.

Thirteen patients evidenced nervousness while

under treatment, an average of 9.3 percent. Eight patients complained of palpitation. This represented an average of 5.7 percent.

The results for the entire series of cases are summarized in table 2.

In no case was there any serious untoward effect from thyrobrom. Gastrointestinal symptoms, nausea and vomiting were not observed. The urine specimens were consistently negative for albumin, red cells and casts in patients who were free of such findings prior to medication. Electrocardiographic tracings taken after thyrobrom treatment showed no significant changes from those taken before medication was instituted.

Table 2
SUMMARY OF 140 CASES OF HYPOTHYROID OBESITY TREATED WITH THYROBROM

Average Age	30 years
Female	101
Male	39
Average Height	64"
Initial Weight	188 lb. (140 cases)
Initial Weight	193 lb. (20 patients who continued treatment for six months)
Average Weight After 3 Months	174 lb. (140 cases)
Average Weight After 6 Months	170 lb. (20 cases)
Average Weight Loss After 3 Months	14 lb. (140 cases)
Average Weight Loss After 6 Months	23 lb. (20 cases)
Initial B.M.R.	plus 4 (140 cases)
B.M.R. After 3 Months	plus 19 (140 cases)
Initial B.M.R.	plus 1 (20 cases)
B.M.R. After 6 Months	plus 6 (20 cases)
Initial Pulse Rate	77 (140 cases)
Average Pulse Rate at Termination of Treatment Period	81 (140 cases)
Nervousness	13 (140 cases) 9.3 percent
Palpitation	8 (140 cases) 5.7 percent
Average Daily Dosage of Thyrobrom	4 grains (140 cases)
Average Daily Dosage of Thyrobrom for Group under Treatment for 6 Months	2¾ grains (20 cases)

Case Reports

The following representative reports of hypothyroid obesity treated with thyrobrom have been selected at random from the 140 cases studied in this series.

Case 1: White female, age 34 years, height 63 inches, weight 200 pounds, married, two children. In this case before medication the pulse rate was 72; B.M.R. was plus 6. There were no abnormalities revealed by electrocardiogram.

A diagnosis of hypothyroid obesity was made and the patient placed upon 2 grains of thyrobrom daily and a low carbohydrate diet of about 1300 calories was maintained.

At the end of one month the patient weighed 180 pounds, the B.M.R. was plus 18 and the pulse rate 70. After three months of treatment, she weighed 175 pounds. The B.M.R. was plus 14 and the pulse rate 70. Electrocardiogram was still negative.

In this case of hypothyroid obesity, during three months of treatment with thyrobrom, there was no evidence of nervousness or palpitation at any time. On a therapeutic dose of 2 grains of thyrobrom daily, the loss of weight was 25 pounds.

Case 2: White female, age 16 years, height 65 inches, weight 205 pounds. The pulse rate on examination was 78, the B.M.R. plus 5. Electrocardiographic tracings were negative.

A diagnosis of hypothyroid obesity was made and the patient placed on 4 grains of thyrobrom daily. A low carbohydrate diet of about 1200 calories which she received prior to thyrobrom was maintained.

After one month the patient weighed 196 pounds. The B.M.R. was plus 3 and the pulse rate 78. After three months the weight was 180 pounds, the B.M.R. plus 6 and the pulse rate 72. There were no abnormalities revealed by the electrocardiogram.

The patient evidenced no nervousness or palpitation during the three months of treatment with a dosage of 4 grains of thyrobrom daily. The loss of weight was 25 pounds.

Case 3: White female, 22 years of age, unmarried, height 61 inches, weight 184 pounds. Prior to medication, the pulse rate was 75, the B.M.R. plus 2. Electrocardiographic tracings showed no evidence of abnormality.

A diagnosis of hypothyroid obesity was made and thyrobrom was prescribed. The patient had been on a limited dietary of about 1200 calories, which was maintained throughout the period of medication.

After three months of thyrobrom therapy, the patient weighed 163 pounds. The B.M.R. was plus 42 and the pulse rate 93. Electrocardiographic tracings were normal. There were no complaints of nervousness or palpitation at any time during the period of treatment.

The weight loss in this case after three months of thyrobrom was 21 pounds.

Case 4: White female, age 44 years, height 64 inches, weight 201 pounds, married, two children. Before medication the B.M.R. was minus 21 and the pulse rate 68. There were no abnormalities revealed by electrocardiogram.

A diagnosis of hypothyroid obesity was made and thyrobrom therapy instituted in a dosage of 4 grains daily. A low carbohydrate diet of about 1300 calories was maintained.

At the end of a month, the patient weighed 185 pounds. The B. M. R. was plus 27 and the pulse rate 78. The dose of thyrobrom was then reduced to 2 grains daily.

After treatment for an additional two months, the weight was reduced to 179 pounds. The B. M. R. was plus 8 and the pulse rate 70. The electrocardiographic findings remained negative. The patient did not complain of nervousness or palpitation at any time during the three months period of treatment.

With an average dosage of 3 grains of thyrobrom daily for three months, the loss of weight was 22 pounds.

Case 5: White female, 29 years of age, height 59 inches, weight 220 pounds. On examination the

pulse rate was 70, the B. M. R. minus 7. Electrocardiographic tracings were physiological.

A diagnosis of hypothyroid obesity was made and thyrobrom was prescribed. The patient had been on a limited dietary of approximately 1000 calories, which was continued throughout the medication period.

After three months of thyrobrom treatment, the patient weighed 184 pounds. The B. M. R. was plus 38 and the pulse rate 100. Electrocardiographic findings were normal. There was no evidence of nervousness or palpitation during the period of treatment.

There was a weight loss of 36 pounds in a three months period. No untoward effects were noted.

Case 6: White female, age 27 years, height 66 inches, weight 301 pounds, married, three children. Prior to medication the B. M. R. was plus 1 and the pulse rate 76. The electrocardiogram was normal.

On a low carbohydrate diet of about 1000 calories and a daily dosage of 4 grains of thyrobrom, the weight had fallen at the end of one month from 301 to 295 pounds. The B. M. R. was plus 15 and the pulse rate 74.

At the end of three months of treatment, the patient weighed 286 pounds. The B. M. R. was plus 12 and the pulse rate 76. The electrocardiogram continued negative. There was no nervousness or palpitation while under thyrobrom medication.

In this case of hypothyroid obesity, there was a weight loss of 15 pounds after three months of thyrobrom treatment in the dosage of 4 grains daily.

Case 7: White female, 43 years of age, height 60 inches, weight 252 pounds. Before treatment the pulse rate was 94, the B. M. R. plus 10. Electrocardiographic tracings revealed left axis deviation.

A diagnosis of hypothyroid obesity was made and thyrobrom was prescribed. This patient had been on a limited dietary of approximately 1200 calories, which was continued during the period of thyrobrom therapy.

After three months' treatment, the patient weighed 214 pounds. The B. M. R. was plus 20 and the pulse rate 98. Electrocardiogram was negative. She did not complain of nervousness or palpitation at any time while receiving thyrobrom.

The weight loss after three months of thyrobrom was 38 pounds. No toxic sequelae were observed.

Case 8: White male, 39 years of age, height 72 inches, weight 323 pounds. Prior to medication the pulse rate was 80, the B. M. R. minus 28. There were no abnormalities revealed by electrocardiogram.

A diagnosis of hypothyroid obesity was made and a daily dose of 4 grains of thyrobrom prescribed. A low carbohydrate diet of approximately 1000 calories was continued during the period of medication.

After a month's treatment, the patient weighed 302 pounds. The B. M. R. was plus 9, the pulse rate 80. On examination following three months' use of thyrobrom, the weight was 300, the B. M. R. plus 15 and the pulse rate 80. The electrocardiogram was normal. After six months' treatment, the patient weighed 286 pounds. The B. M. R. was plus 19, the pulse rate 80. Electrocardiographic tracings were negative. The patient did not complain or nervousness or palpitation at any time during the six months of treatment with thyrobrom.

On a dosage of 4 grains of thyrobrom daily for six months, a weight loss of 37 pounds occurred.

Case 9: White female, age 44 years, height 63 inches, weight 202 pounds, married, one child. Prior to medication the pulse rate was 72, the B. M. R. plus 11. No abnormalities were revealed by electrocardiogram.

A diagnosis of hypothyroid obesity was made and the patient placed on a daily dose of 2 grains of thyrobrom. She had been on a low carbohydrate diet of about 1000 calories which was continued throughout the period of medication.

At the end of a month the patient weighed 198 pounds. The B. M. R. was plus 20 and the pulse rate 70. At the end of three months the weight was 192 pounds, the B. M. R. plus 18, the pulse rate 70. Electrocardiogram was normal. At the termination of six months of treatment, the patient's weight was 180 pounds. The B. M. R. was plus 22 and the pulse rate 70. Electrocardiogram continued negative. No nervousness or palpitation was apparent at any time during the entire period of medication.

On a daily dosage of 2 grains of thyrobrom, the loss of weight in six months was 22 pounds.

Case 10: White schoolboy, 10 years old, height 61 inches, weight 164 pounds. Prior to treatment the B. M. R. was plus 8, the pulse rate 70. No abnormalities appeared in the electrocardiogram.

A diagnosis of hypothyroid obesity was made and a daily dose of 2 grains of thyrobrom was prescribed. A low carbohydrate diet of about 1250 calories which was his usual intake was continued throughout the period of medication.

After the first month under this regime, the patient weighed 158 pounds. The B. M. R. was minus 1 and the pulse rate 74. On examination after three months of treatment, the weight was 151 pounds, the B. M. R. plus 1 and the pulse rate 74. Electrocardiogram was negative. After six months, the patient weighed 139 pounds. The B. M. R. was plus 6 and the pulse rate 74. Electrocardiogram continued negative. There was no evidence of nervousness or palpitation at any time during the six months treatment period.

A weight loss of 25 pounds was realized in six months with thyrobrom in a dosage of 2 grains daily.

Summary

Summarizing the results of the use of thyrobrom in 140 cases of hypothyroid obesity, there was an average weight loss of 14 pounds on an average daily dosage of 4 grains of thyrobrom over a period of three months. This may be averaged as a weight loss of approximately 4½ pounds per patient per month.

For a group of twenty patients who continued treatment, there was an average weight loss of 23 pounds after six months of thyrobrom therapy or an

average weight loss of approximately 4 pounds per patient per month.

The weight loss was not accompanied by significant toxic manifestations. Nervousness and palpitation were present in such a small percentage of cases that toxicity must be regarded as minimal. The increases in basal metabolic rate and pulse rate are insignificant. There were no other adverse reactions following the administration of thyrobrom administered for as long a period as six months.

Thyrobrom (brominated thyroid) must therefore be regarded as an effective therapeutic measure for the reduction of overweight due to thyroid hypofunction. Significantly successful results may be attained without untoward effects from its use.

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VINCENT'S ANGINA—TREATMENT WITH PENICILLIN BY ATOMIZER

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Vincent's Angina has been successfully treated by various drugs and antibiotics. Of all the various medicaments, penicillin has been found to be the most efficient in controlling and aborting the infection. However, the methods used are either time consuming for the physician or nurse, expensive, painful or objectionable. Particularly is this true for infants and children who object to topical applications to the gums and in the mouth, mouth washes, or to repeated injections.

The use of a penicillin lozenge in this young age group is often valueless because the child objects to the method or is unable to cooperate properly in bringing the lozenge in proper contact with the gums and other infected areas.

A solution of crystalline penicillin containing 100,000 units to 30 cc. of distilled water or normal saline was used in an atomizer and sprayed on the gums and in the mouth every two hours. The dosage can be varied according to desire and the method is easily carried out. Children themselves delight in spraying the solution on the gums and in the mouth and often view the atomizer as a toy making the procedure a pleasant one for all concerned. Infants are also easily handled with this procedure and irritation by topical application is thus avoided.

The method lends itself to flexibility in dosage and also allows the penicillin to come in contact with infected tissues regardless of location in the oral cavity.

Compared to other methods it is pleasant, economical and above all efficient. Usually within 48 hours the condition is considerably improved allowing the child to take nourishment without pain. Most cases are completely recovered within three or four days. A preliminary injection of penicillin may be used in severer cases, if feasible, but it is not absolutely necessary. An ordinary atomizer suffices for this treatment.

Over twenty cases were treated with this method and the results were excellent in all. Only four cases required treatment for more than four days. Compared to other types of treatment the control and cure of Vincent's Angina is as rapid and efficient by the use of crystalline penicillin solution sprayed on by the common atomizer as any other type treatment devised to date, including mouth washes, local applications, sulfonamides, nicotinic acid, bismuth, arsenical or penicillin injection therapy. Certainly it is a most pleasant and economical method.

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AGING AND MALIGNANT PROCESSES

Alterations In The Calcium-Binding Mechanisms Through Alkalosis And Acidosis

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In considering the title of this article, it must be understood that the facts upon which it is based are not too fixed or determined. Increased interest is being directed to the study of the biochemical processes concerned in the aging phenomenon, and the concomitant disorders such as atherosclerosis, neoplastic growths, alkalosis and acidosis, that are correlated with such processes. Though final conclusions are not possible, it appears advisable that certain observations be reported at this time as an incentive to further investigation along the lines suggested herein.

Among the more important studies that should command greater attention here are those concerning the disturbed acid-base equilibria observed in such conditions as atherosis and carcinosis that materially alter the calcium binding and enzyme mechanisms to lead to the development of pathological processes (1, 2, 3, 6, 7, 8).

In health, the acid-base balance of the blood remains remarkably constant at a pH about 7.4 notwithstanding carbonic, phosphoric, sulfuric, hydrochloric, lactic, acetic and carbonic acids which are continually being formed in the processes of metabolism. The adjusting mechanisms called into play to neutralize and remove excess acid are carried out with extraordinary efficiency. Carbonic acid, a product of tissue activity, is produced in greater quantities (800-900 gms.) than any other acid in the body.

In diabetes mellitus, such acids as hydroxybutyric and aceto-acetic acids are produced in excessive amount, and the adjusting mechanisms are unable to neutralize and remove the excess acids which accumulate in the system (2).

As is known, the normal reaction of the blood is protected by several lines of defense, e. g., the buffer systems, the excretion of CO_2, the chloride shift, and the excretion of fixed acids. Carbonic acid, H_2CO_3, is buffered mainly by a base released from hemoglobin, and to some extent in the plasma through the protein and phosphate systems. When carbon dioxide enters the blood, the sodium bicarbonate of the plasma increases. As the blood passes from the arterial side to the venous, CO_2 is absorbed and diffuses into the red blood cells. Herein, through the action of an enzyme, carbonic-anhydrase, the CO_2 is converted into carbonic acid.

During rest the pH of the venous blood is reduced (pH 7.28), being more acid than the arterial (7.4). In disordered blood states, e. g., the dysfunction or inactivation of the enzyme, carbonic-anhydrase, the carbon dioxide conversion is interfered with; the carbonic acid becomes decreased, while the bicarbonate is increased. Such a state results in an alkalemia. When carbonic acid production is increased, the bicarbonate becomes reduced as the base is given up for the neutralization of the strong acids, and an acidemia results. Carbonic acid readily dissolves calcium carbonate to a considerable extent, forming a soluble acid-calcium carbonate (1, 2, 3, 4).

It is in accord with the laws of chemistry that the diffusibility of calcium varies with the pH of the media, and which also applies to magnesium and phosphorus. For proper metabolism, not only must the ratio between these, and the absolute amount of each at that ratio be maintained, but the diet and the digestive and other body fluids in general must remain in proper hydrogen-ion concentration. In a well-marked case of rickets, for example, the gastric juices not only are less acid than normal but calcium retention is low, the intestinal contents becoming decidedly alkaline (2, 3).

Such a state, as just described, is not conducive to the absorption and utilization of calcium, magnesium and phosphorus. Vitamin D here, in addition to other effects, is of benefit as it also lowers the pH of the intestinal secretions thereby facilitating proper absorption and utilization of these essential agents. Plasma is normally poor in magnesium and potassium but rich in calcium and sodium; whereas in the cells the conditions are reversed, these showing a high concentration of magnesium and potassium and low in calcium and sodium.

A magnesium deficiency, clinically, is indistinguishable from a calcium deficiency. Magnesium has the positive function in the body of ion balance, and the maintainence of the proper pH of the blood and tissues. It also plays an important role in the biochemic and physiologic processes of both animal and vegetable life, in preserving the electrolyte concentration of the fluids, and in maintaining the osmotic pressure of both intracellular and extracellular solutions. There is some direct relationship between the functions of the parathyroid gland and the biochemistry of magnesium, for in dysfunctions of this gland the body magnesium becomes reduced (2).

There is a definite ratio between sodium:potassium, and calcium:magnesium:phosphorous in the body. Though their ions have much in common, a disproportion or additions beyond these ratios speed up elimination of the others. Deficiencies also result through insufficiencies in the diet, and from faulty utilization, absorption and/or interference by other mineral supplements, catalysts, etc., which reduce their availability. When animals are kept on feedings too high in magnesium carbonate, there results a high incidence of renal calculi and other disorders.

These disorders can be corrected, and prevented, by the addition of excess calcium carbonate to the diets. A magnesium deficiency, by causing a relative calcium excess in the body, is indirectly incriminated in the etiology of atherosclerosis and certain other

calcium disorders (1, 3, 4). However, this is of secondary concern at the moment.

A decreased production of carbonic acid (alkalemia) over a period of time causes a supersaturation of the blood with lipid-calcareous matter which, being insoluble in excess alkali media, is thrown out of solution to be abnormally deposited in the tissues. Such appears to be the primary factor in the etiology of arteriosclerosis, *Paget's disease*, myositis ossificans, and other like disorders. The pH of the venous blood is always more acid than that of arterial blood and the salts there are readily maintained in solution. This would explain the rarity of a phlebosclerosis.

Regulation of the Acid—Base Balance

The pH of the blood in health varies but little. In disease, the pH, unless in the terminal stages of uremia, diabetic coma, eclampsia, extreme starvation, etc., rarely reaches a pH of 7.0. The limits of the pH compatible with life are probably neither higher nor lower than 7.8 and 6.8 (2). A pH of 7.0 results in complete heart block, this being the cause of death in starvation.

A rise in blood hydrogen-ion concentration (alkalemia) causes not only a vasoconstriction but also acts as a stimulus to the vasomotor center to contribute to a general rise in blood pressure. In healthy carnivora the alkali reserve parallels the blood pressure, and in advancing years, when the growth-processes have subsided, an alkalosis is a normal happening. When alkalis are ingested over long periods of time, the rise in H-ion concentration results in vasoconstriction and an elevation in blood pressure, and causes the circulating hemoglobin to hold more firmly its gathered oxygen. Such a condition obtains also in those with abnormal alkali retention.

Alkali poisoning readily occurs in those abnormally sensitive to alkali therapy (1, 2, 3). The important changes in the blood in an alkalotoxicosis are: a definite uncompensated alkalemia, increased C/N ratio, hypercalcemia and other manifestations. A long-standing alkalosis leads also to severe nitrogen retention, anoxemia, calcium and lipid depositions, fibrosis, early senescence, and tissue breakdown through lowered tissue respiration (1, 2, 3, 4). (Alkali therapy also exerts a deleterious effect upon the C and the vitamin B-complex as both are unstable except in acid media.) Several of the symptoms observed in a chronic alkalotoxicosis probably are due to such vitamin destruction.

An alkalemia, by causing vasoconstriction, leads to reduced blood supply to the vasomotor center so that a general blood-pressure rise occurs. Such a state would exert deleterious effects upon the normal vasodilating substances such as acetylcholine, histamine, etc., which are susceptible to alkali and become inactivated or destroyed in any but acid media. The electrogenic properties of acetylcholine, with the tissue acidity and body CO_2, provide the activating forces of the respiratory center.

Upon the ratio $H_2CO_3/NaHCO_3$ the pH of the plasma depends (2). Rapid adjustments of this ratio are brought about mainly through the exquisite sensitivity of the respiratory center to changes in pH and the chloride shift mechanism. The slightest reduction in plasma-bicarbonate through its decomposition by acid is met by increased pulmonary ventilation with the elimination of carbon dioxide by the lungs. Low arterial and alveolar CO_2 tensions are therefore associated with a low alkali reserve. On the other hand, when excess CO_2 is contained in the blood, a compensatory increase in bicarbonate (chloride shift) results; so, high arterial and alveolar tensions are associated with a high alkali reserve.

When excess CO_2 is removed from the body, as by forced breathing, a movement of bicarbonate and chloride ions occurs in reverse direction. The hydrogen-ion concentration of the saliva is found to vary directly with the CO_2 content of the blood; when CO_2 tension in the blood is high, more CO_2 finds its way into the salivary secretions to lower the pH. Ingestion of sodium-bicarbonate, while reducing the acidity of the urine, increases the acidity of the saliva as a CO_2 tension results. In forced breathing the H-ion concentration of the saliva is raised as it lessens the amount of CO_2 in the saliva. Under certain conditions a reduction in the alkali reserve can occur with little or no change in the blood reaction (2).

Acidosis and Alkalosis

Much confusion has arisen over the terms "acidosis" and "alkalosis". Acidosis cannot mean any real acidity of the blood, i. e., a blood pH below 7.0, for this is incompatible with life. Alkalosis carries the corresponding meaning of an increased alkali reserve. This may or may not be associated with a rise in the blood pH (Best & Taylor 2). The terms suggested for these acid-base states are alkalemia and acidemia. The British Medical Council has recommended that the term acidemia be used for a state in which the pH is lowered, and that the term acidosis be restricted to indicate only a lowered reserve with unaltered pH. Alkalemia would indicate a blood state in which the pH was raised; alkalosis would be retained to indicate an increase in the reserve alkalinity (2).

An alkalemia may result from an uncompensated alkali excess, the $NaHCO_3$ is increased without a proportional rise in the H_2CO_3. This may result from ingestion of large quantities of alkali, or from loss of HCl as in severe mal-de-mer, and other prolonged vomiting states. An uncompensated CO_2 deficit also produces an alkalemia. A disturbance of this nature results from forced breathing, hyperventilation, high altitudes, etc., the increased alkalinity here occurring within the red blood cells. This condition is not uncommon to aviators, and would explain some of the adverse effects experienced in altitude flying prior to acclimatization. Hyperventilation symptoms also obtain in neurocirculatory asthenia, acting through the resultant respiratory alkalemia, and in hysteria, severe encephalitis, etc.

When there is an uncompensated CO_2 excess, an acidemia results. The carbonic acid is increased but is not balanced by a proportional rise in the sodium bicarbonate. The pH is lowered. Such a condition is noted in obstruction to breathing, and in depression of the respiratory center by morphine (2). The

pH of the blood is also lowered in an uncompensated alkali deficit; the bicarbonate being reduced without there being a parallel reduction in the body acids. This occurs when large quantities of fixed acids are produced, e. g., in diabetes, the terminal stages of nephritis, etc.

Arteriosclerosis

Innumerable factors apparently enter into the etiology of arteriosclerosis. (As there is no clear-cut conception of the various subdivisions, the generic term, arteriosclerosis, is used here to include atherosclerosis, Monckberg's sclerosis, arteriolar and senile.) That calcification plays a prominent role is not to be denied, but the factors determining the lime and lipid deposition remain a mystery. One phase overlooked in the study is the disordered pH of the blood and tissues prior to the deposition of the lipid material and metallic salts in the walls of the arteries.

It is thought by some investigators that the onset of degenerative change is secondary to deterioration of the elastic tissue of the intima and media which, by weakening the arterial wall, permits distention of the vessel. The stretching, it is presumed, interferes with the blood supply of the vascular wall; the intimal thickening being looked upon merely as a compensatory process. Others believe that arterial calcification is simply a particular type of dystrophic calcification, not specific in nature, but induced by a toxic agent.

Calcium deposition in the arterial walls is often a pronounced feature of metastatic calcification, this term implying a translocation of calcium from the skeleton to the soft tissues (2). Such an organic disturbance has been observed in animals fed excessive amounts of parathyroid, fluorine salts, lipid and cholesterol-rich food, irradiated ergosterol, vitamin D, etc. Though such lipid-calcium deposits may occur in any of the soft tissues, the arteries, kidneys and lungs are most prone to calcification.

Lime salts, cholesterolester and lipid depositions, hyaline thickening and fibrosia, readily occur in any tissues where the cells become more alkaline in nature (1, 3, 4, 8). As calcareous matter is readily deposited in lipid material in alkali media, the first evidences in the tissues would then be cholesterol in lipid deposits (1, 3, 4, 8).

Such arteriosclerotic changes would make their appearance first in the minute ramifying vessels (vasa vasorum) which readily become obstructed, this in turn leading to anoxia and degenerative changes in the intima of the vessels. Such salts deposited have the same composition as the main mineral constituents of bone. Dried bone contains about 31 percent organic matter combined with 69 percent mineral matter. Of this about 59 percent is tricalcium phosphate, 1½ percent magnesium phosphate, and 7 percent calcium carbonate.

Human bone frequently contains calcium fluoride to the extent of 2 percent though the quantity of fluorine compared with the other constituents of bone is extremely small. It may well play the part of a catalyzer, acting as a sensitizer for the phosphates and enabling the phosphorus and calcium to combine with the tissues.

The percentage of fluorine in calcified vessels has not been determined. The action of this element resembles somewhat the specific effects of sunlight and vitamin D, both acting as catalysts to aid calcium deposition, and building bone from the calcium and phosphorus complexes.

The proper dietary and prophylactic measures which appear to be indicated in arteriosclerosis, hypertension, and certain calcium-lipid metabolic disorders, are diets that tend to keep the patient on the "acid side". A sub-caloric diet is always beneficial. Contraindicated would be a strictly vegetable-fruit diet on account of the high alkalinity ash; and likewise milk, eggs and other foods rich in cholesterol, fats, oils, etc. With the exception of kidney, liver and brain, there is no justification in eliminating meat and fish from the diet. If edemic and like states are complications, then sodium chloride should be reduced to the minimum and appropriate potassium therapy instituted in order to speed up elimination of the sodium ions in the system. An induced acidemia, i. e., the shifting of the pH toward the acid side by such acidifying agents as phosphoric, hydrochloric and lactic acids, ammonium chloride and other acidogenic agents, should aid in preventing further deposition of calcium-lipid material. Such a measure would also exert certain hypotensive effects, and the pH shift would effect some dissolution of the pathological deposits in the tissues.

Diets of acid ash and low caloric value, and those of high carbohydrate and low fat as rice, barley, whole wheat, buttermilk, consomme, cocoa, cranberry, rhubarb, etc., accomplish the same acidogenic and weight-reducing effects with subsequent depression of blood pressure. Exercise in moderation is not contraindicated because it creates lactic acid and other organic acids which lower the body's alkaline reserve.

A strictly sedentary life without exercise is not desirable as it raises the alkali reserve through lowered production of the body acids. When extensive degenerative changes have occurred in the arterial walls, the mineral salts and lipid material having replaced the normal muscular and elastic tissues, then no dietary or therapeutic measures would be likely to restore structures so injured, and would then be of little avail.

Hypertension *per se* is not a disease but only a symptom peculiar to several hypertensive-producing effects, e. g., cardiorenal vascular disorders, exogenous and endogenous toxicoses, pressor drugs, etc. Like the atherosclerotic states, there is more than one etiologic type of hypertension, and more than one precipitating factor.

One type results from intrarenal vascular imbalance with protein and tissue disintegration, and the elaboration of pressor agents as angiotonin, methylguanidine, adrenalone, and tyramine (from breakdown of tyrosine and phenylalanine), agmatine (from arginine), and renin (tyramine?).

In extracts of kidney, and in urine, there is found counterbalancing pressor substances. This is of more than academic interest for the loss of such pressure-reducing substances, either through excretion, or insufficient production to keep pace with the

relatively large amounts of pressor substances produced, could well become etiologic factors in hypertension. Most of these agents appear to be enzymes, one such being tyrosinase which inactivates tyramine, and prevents tyrosine and its precursor, phenylalanine, from breaking down to tyramine. Tyrosinase would only be effective if the hypertension should be the result of a tyraminosis (5).

Tissue—Calcium in Senescence and Carcinoma

Dr. Albert Lansing, in a recent issue of *Science* (6) correlates the changes in intracellular calcium with age and malignancy. He notes, as have others, that body calcium increases with age, and that between the cells calcium is increased in some locations and decreased in others. He found that the changes occurring in intracellular calcium is an important factor in both aging and malignancy, and that such calcium increase with age occurs in the cell periphery or cortex.

This increased calcium apparently produces a decrease in permeability of the cell membrane to result in an accumulation of metabolic waste products of more or less toxic nature within the cell, and which in turn produce the changes associated with senescence. His studies to determine the effect of experimental alteration of the calcium content of the cells on longevity showed that under carefully standardized environmental, nutritive, and genetic conditions, the organisms living in a low calcium medium will live longer than those in control animals.

The experimental removal of calcium from the cells by sodium citrate results in a marked increase in longevity. Calcium increases with age in the cell cortex, and a decrease extends the period of life. Others have found that intermittent fasting in animals extended their life span. The explanation may lie in the fact that fasting is not conducive to calcium retention through the lowering of the pH of the tissues. Other reports show that a reduction of caloric intake also reduces the incidence of mammary cancer in susceptible strains of mice, and also inhibits development of leukemia induced by methylcholanthrene but not if the intake is composed mostly of fats.

The study of the acid-base balance in health and disease should explain, materially such problems as the increase in calcium in the cessation of growth (aging); the atherosclerotic and allied states, and the decrease of intracellular calcium in malignancy.

Should the body tissues and fluids not remain in normal acid-base equilibria, cell activity becomes altered, and certain parts eventually undergo pathologic and carcinomatous change. The change may be a degenerative one as that in arteriosclerosis, or the cell enzyme systems become deranged to result in altered biochemical activity with cell deficiencies of essential agents. Such tissue changes with altered acid-base balance also become less resistant as to accept bacterial and viral invasion (1, 3, 4, 5, 8,).

Tissues with altered pH readily become suitable locales for the growth of various infectious agents. Each living organism requires a certain hydrogen-ion concentration for normal metabolic activity, growth and survival. Any material change in this concentration fundamentally alters, and effects adversely, the organism (12). Two organic diseases, among many, and intimately allied to acid-base disturbances, are pernicious anemia and beri beri. In both disorders the cord degenerates apparently the result of changes in the acid-base balance which is brought about mainly by an achlorhydria and a vitamin B_1 deficiency or destruction. An hypochlorhydria often follows a B-complex avitaminosis, and vice versa.

The central nervous system, spinal fluid, and allied structures are subject to change in acid-base equilibria as other body tissues. Such changes may occur prior to and during the invasion of the poliovirus. As is known, this disease causes a degeneration of the central nervous system and the gray matter of the cord with varied changes in the pH of the tissues which, most-likely, aid in the infection gaining a foothold in the body (12).

Another pathogenic agent, the mycobacterium tuberculosis, requires a media under pH 7.4 for optimum growth; pure cultures being best obtained in slightly acid media. All organisms but the tubercle bacilli are killed in 15 percent sulfuric acid. Cultures of the bovine type are at first acid but become alkaline while those of the human species never do so. Tuberculin is highly acid. In this infection, and also in leprosy, the alkali reserve shows the average figures of the actual acid-base reactions to be diminished. This fact alone would indicate instituting some form of alkalotherapy to help shift the pH toward the alkaline side (12).

The usual dietetic and therapeutic measures in both diseases are curative in that they induce and alkalemia, raise the blood pressure, and aid in fibrosis, calcium and lipid deposition, with walling-off of foci of infection. Hypotension is a common feature, and an acidosis is one of their main complications. Preliminary data show that an acidemic state precedes and favors the infection. An acidotic state sets up a vicious cycle by retarding the processes of organic combustion which, in turn, further the increased acidity of the body tissues and fluids. Such acidemic and hypotensive states are further aggravated by low caloric intake, acidifying diets, and the fever accompanying the exhausting illness.

An induced alkalemia and hypotension in both tuberculosis and leprosy favor lime deposition and fibrosis, such areas then inhibiting bacterial growth (12). Residence in high dry climate helps raise the tissue pH, induces hyperventilation, elevates blood-pressure; all highly desirable in aiding recovery. Sunlight and sub-erythema doses of ultraviolet irradiation are destructive to the bacilli, and such measures also aid in calcium lipid and cholesterol depositions, with fibrosis and calcification at the sites of infection.

Diets found beneficial in both disorders (but obviously contraindicated in atherosclerosis and certain allied disorders), are liver, brain, kidney, milk, cream, eggyolk, butter, cod liver oil, etc., all favor hypercalcemia and lime deposition with a general rise in the pH of the tissues. Parathyroid and fluorine

compounds have therapeutic value for similar reasons. Parathyroid extract reduces the body phosphorus thus causing a reciprocal calcium increase. This hormone, with low calcium intake, mobilizes lead from the bones (plumbism), and liberates radium deposits to be excreted from the system.

Biochemical Disturbances in Carcinoma

The pH of cancer tissue is quite low and in consequence its calcium content would be expected to be low (8). In such tissue there is a marked fault in the metabolism of glycogen, and an excess of lactic acid, the result of disturbed enzyme systems. The venous blood from carcinoma contains more lactic acid than any other venous blood. Body tissue lower in glycogen in nature appears to be potential cancer tissue.

Recoverable from urine of cancer subjects is an unidentified tryptophane-derivative $C_5H_5NO_3$, appearing to be related to indigo, but its significance has not yet been determined. This derivative, acting as a reducing agent, may be responsible for the decolorizing of the methylene blue in the urine of cancer patients when this dye is given internally. Several trypotophan derivatives as indole-butyric acid, indole-acetic acid, etc., have marked growth-stimulatory effect on both animal and vegetable matter.

However, mere stimulation of cell multiplication and growth, and without causing intracellular disturbances, does not, in itself, cause such tissue to become malignant.

Substances that accelerate growth in small amounts, as a rule, inhibit growth in large amounts. Perhaps analogues of tryptophan, or synthetic substances with similar molecular configurations (competitive analogues), in experimentation, might show that certain tryptophan derivatives are carcinogenic, and that the latter effect would be eliminated by the use of such analogues to deprive the growth of the aminoacid tryptophan. This is interesting to speculate.

Further effort should be directed toward depriving malignant tissue of those essentials necessary to continued growth. As the nuclear material of the cell is sensitive to extrinsic carcinogenic effects, and being closely related to virus reproduction and growth, such degradation of cell protoplasm could become the true carcinogen that stimulates growth by indirect cell division.

It is difficult to assess the modus operandi and value of such therapeutic modalities as radium, Roentgen ray, iodoacetic acid and iodoacetate, methylnaphthaquinone, magnesium chloride, methylene blue, toluidine blue, iodonitrobenzoic acid, metadinitrobenzene, zinc chloride, parathyroid extracts, and also those from spleen and connective tissue, etc. (8). Some of these agents are definite protoplasmic poisons, and mitotic inhibitors, while others inhibit the growth by inducing fibrosis and connective tissue formation in and about the growth and the walling off of the vascular and lymphatic systems. Some of these agents apparently aid in the restoration of proper tissue enzymosis, restoring the acid-base equilibrium and the proper metabolic activities of the cells. There is no experimental evidence that some of these measures will increase the cell calcium content.

More-recent data tend to show that the extrinsic carcinogenic agents are merely the trigger mechanisms in deranging the susceptible enzyme systems, and disorganizing the sensitive cell tissue components, and that the true carcinogens result from this chain reaction to reproduce themselves much in the manner as do the viruses. It would be of interest to submit material such as heart tissue, growing in vitro, to the effects of known carcinogens, and to also supply to the culture medium of such tissue the radioactive and stable isotopes to study the intermediary metabolism and remote mutational effects, if any. Primary carcinoma of the heart is a rarity.

Lewisohn (13) states that primary carcinoma of the spleen has almost never been found, and cannot be experimentally produced, nor their growth of tumor tissue even when fragments are implanted into the organs. Metastasis to the spleen from primary growths elsewhere are also rare, and diffuse neoplastic infiltration of the spleen does not occur. Further study of both the heart and splenic tissues are in order, and the possible isolation from them of natural growth-cell inhibitors is a possibility.

Suntzeff and Carruthers (6, 9) have shown that there is a 50 percent reduction of total calcium in methylcholanthrene-induced epidermal hyperplasia from that of normal epidermis, and in squamous cell carcinoma a still further reduction of about 60 percent from precancerous hyperplastic epidermis. Brunschwig *et al* (6, 10) also found a sharp drop of calcium in carcinomatous tissue.

Lansing (6) stated that if cessation of growth is a significant factor in aging, and if a mechanism involving calcium increase is an integral part of the system, one would expect to find the opposite situation in cancer.

Cancer may be regarded as a very youthful and vigorous tissue with tremendous and uncontrolled growth capacity. He studied the nature of the calcium decrease in hyperplastic mouse epidermis and resulting carcinomata by means of ultrafiltration. It was found that the ultrafilterable calcium fraction of a squamous cell carcinoma was sharply reduced on both an absolute and relative basis, and that the base-binding capacity of an organic fraction which binds calcium is altered in some manner in cancer. (This factor, most-likely, rests in the disturbed enzyme systems and the lowered pH of the malignant tissue. R. deR. B.).

Coman (6, 11) has found that normal cells are more readily separated by micromanipulation when in calcium-free medium than when in balanced salt solution, and has demonstrated that cancer cells are more-readily separated than are normal cells. He believes that the decreased adhesiveness of cancer cells results from a local calcium deficiency which facilitates separation of these cells from one another.

Lansing (6) offers an alternate hypothesis that an organic calcium-binding complex of the cell cortex plays an integral part in the growth-regulatory

mechanism of cells and that at the time of cessation of growth this calcium-binding complex, presumably a protein, is altered or reoriented in such a way as to increase calcium-binding capacity. Thus a mechanism is offered which at least in a general way synchronizes the changes that occur with age.

When the calcium-binding system becomes altered in such a manner as to decrease calcium binding, growth does not cease, age changes do not occur, and, in effect, the state of affairs exists that it is associated with cancer. This hypothesis is also compatible with Coman's concept of the invasiveness of cancer.

Conclusions

A summary of the evidence shows that a long-continued alkalemia and alkalotic states predispose to atherosclerosis, *Paget's* disease, *Buerger's* disease, myositis ossificans, and certain other calcium metabolic disorders, and bone and joint affections.

An alkalemia arises through an uncompensated carbon dioxide deficit; from loss of HCl as by vomiting; ingestion of alcohol when it reaches a concentration in the blood of one-tenth percent; forced or shallow breathing; asphyxia; hyperventilation induced by high altitudes and hot bathing; vasoconstricting drugs; tea, coffee and tobacco; fluorine compounds, parathyroid extract; disordered parathyroid metabolism; diets limited mainly to milk-egg (cholesterol content); fruit and vegetable diets on account of excess base-forming elements, etc.

A prolonged alkalemia results in a supersaturation of the blood with lipid and calcareous matter which are thrown out of solution due to insolubility by the increased alkali pH. Such deposition occurs in specific tissues more reactive to changes in the acid-base equilibrium. The vasa vasorum, due to minute size, are first to become obstructed to result in subsequent anemic, ischemic and anoxic states of the arterial vessel. Local anemia and anoxia favor calcification, any tissue more alkaline in nature and where the CO_2 production is minimal, is liable to fibrosis and calcium-lipid depositions.

An alkalemic state acts as a stimulus to the vasomotor center to cause further vasoconstriction and a general rise in blood pressure. Such a state also exerts a deleterious effect upon both the circulation and the cardiac output. An alkalemia neutralizes the essential organic acids necessary to the vital functionings of the body, and which are needed in maintaining the acid-base equilibria and the salts in solution.

Abnormal alkali retention is an etiologic factor in hypertension. Such excess or retention of bases as sodium bicarbonate causes rises in the blood pressure, and prevents release of oxygen in hemoglobin. This leads to lowered tissue respiration and local ischemic, anemic and anoxic areas in susceptible soft tissues that fibrosis and tissue breakdown ensue.

Alkali tolerance tests should reveal potential or latent hypertension, preatherosclerotic and like states through alkali retention. A long-standing alkalemia and extended alkalotherapy exert destructive effects upon other essential agents as the vitamins C and B-complex, minerals, etc., and lead, eventually, to signs of such deficiencies.

A defective blood-enzyme state such as a fault in the carbonic-anhydrase enzyme prevents proper conversion of CO_2 to carbonic acid which would eventually lead to an alkalemia and alkalosis.

The normal process of aging is accompanied with an alkalosis and a resultant hypercalcocytosis.

Cancer tissue results from a disturbance in the sensitive tissue-cell enzyme systems from either intrinsic or extrinsic means. There is caused to be liberated nuclear degradation products, or carcinogenic viruses, which stimulate abnormal cell growth, hyperplasia, tissue breakdown and the production of toxic products. The lowered pH of such tissues prevent proper utilization of such elements as calcium, and other essentials, that a state of insufficiency arises. Efforts should be directed toward restoration of the acid-base equilibrium of the affected tissues, and the normal enzyme systems, that utilization of the essentials be properly effected. Inducing fibrosis and connective tissue in and about the diseased areas would also act to inhibit further cancer growth and metastasis.

The study of the physiology of the acid-base equilibrium shows the importance of metabolic disturbances in the beginning and the development of certain pathological processes, though some of these depend upon special dysergic conditions of the patient. Blood and tissue examinations, when possible, should include the H-ion concentrations. If found to vary from the norm, the causes should be ascertained and corrective measures instituted. A simplified method should be devised to quickly determine the hydrogen ion concentrations of the body tissues and fluids.

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CUMULATIVE EFFECT OF ALPHA TOCOPHEROL ON THE INSULIN REQUIREMENTS IN DIABETES MELLITUS * †

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The author, having worked with Drs. E. V. Shute, W. E. Shute and Floyd Skelton on the treatment of cardiovascular disease with alpha tocopherol (1) (2) (3) (4) (5) (6) (7) (8), has treated about 1500 patients with this preparation. It was inevitable that some few of those cardiovascular problems would also have diabetes mellitus. It may here be pointed out that none of these were discovered by this author. All had been diagnosed and put upon maintenance therapy with insulin preparations by other physicians previously.

Both Dr. W. E. Shute of Guelph, Ontario and Dr. Geo. Dowd of Worcester, Mass. as well as the author noted that, if the insulin dosage was not reduced considerably after beginning the large doses of alpha tocopherol, the diabetic patients might suffer mild hypoglycemic reactions. Symptoms such as: shakiness, "chills without feeling cold", dizziness, "creepy sensations" and faintness, were often noted. These symptoms, of course, disappeared when the insulin dosage was adjusted at a lower level. This new level was maintained quite well and none was obliged to return to the former high dosage unless the alpha tocopherol was discontinued.

Molotchick has reported (10) three cases of cardiac disease satisfactorily treated with alpha tocopherol. Case 1 of this series, a fifty-five year old male who had had coronary occlusion 10 years previously, showed a blood sugar level of 214 mgm. percent and 2.2 percent urinary glucose. On a relatively small daily dosage of about 100 mgm. alpha tocopherol (200 mgm. mixed tocopherols) he obtained relief from his anginal distress.

What is almost as interesting is, that in approximately five months he had a blood sugar level of 125 mgm. percent and negative urinary glucose. In retrospect one could wish that blood sugar and urine investigations had been recorded sooner than five months after therapy, as these might have shown such results in two or three weeks time. This case illustrates the more or less "immediate action" of alpha tocopherol on diabetes mellitus.

The author has observed the cardiac status of many of these patients for a protracted period of time. After eight to twelve months of this therapy some of the diabetics in the series were able to stop the insulin altogether. Blood sugar and urinalysis then revealed normal glucose values (9). The author has treated 12 to 15 such cases who had been diabetics requiring both insulin and diet for several years and who now, after taking large doses (200 to 400 mgm.) of alpha tocopherol for many months, need insulin no longer. All these patients were over 48 years of age. Since most of these cases do not live in this vicinity it is impossible to present them all; but for purposes of illustration the following cases are described in some detail.

Case A: Mrs. M. C.—77 years. Arteriosclerotic heart disease with moderate cardiac enlargement, regular sinus rhythm, mitral regurgitation and anginal pain. She had had an anterior coronary occlusion seven years previously.

On 25 units Protamin Zinc insulin each day, and a 2000 caloric diabetic diet, she showed 1 percent glycosuria and blood sugar of 200 mgm. percent.

Eight days after beginning to take a daily dose of 300 mgm. alpha tocopherol, her urine became sugar-free and the insulin dose was accordingly reduced to 20 units of Protamin Zinc insulin. On this regime urine specimens remained free of glucose and the dose was next reduced to 15 units of Protamin Zinc and maintained at this level for eight months. At that time a slight reaction was noted and therefore the insulin was stopped altogether. She has shown no glycosuria or hyperglycemia since. The maintenance dose of alpha tocopherol now needed to keep her symptom-free and active is 240 mgm. per day.

Case B: Mrs. J. C.—65 years of age. Hypertensive cardiovascular disease with enlarged heart, regular sinus rhythm, mitral regurgitation, and anginal distress. BP 240/120. Taking 10 units Protamin Zinc Insulin daily she showed 0.5 percent glycosuria and 190 mgm. percent blood sugar.

On 180 mgm. alpha tocopherol daily there was a mild reaction and therefore the insulin was discontinued. During the eight months that had since elapsed the urine has been sugar-free when tested

* In conjunction with the Shute Foundation For Medical Research.
† As prepared for the Vitamin E Symposium, Montreal General Hospital, May 15, 1948.

on an average of once every three weeks. The fasting blood sugar level is now 90 mgm. percent.

Case C: Mrs. M. B.—housewife of 62 years. She had taken 20 units Protamin Zinc Insulin daily for 12 years. She had had severe rheumatic fever as a girl, a grade (4) rough aortic systolic with thrill to neck. Diagnosis was rheumatic heart disease with marked enlargement, pulmonary and peripheral oedema, aortis stenosis and hypertension.

When she was given a daily dose of 375 mgm. alpha tocopherol and 0.1 mgm. digitoxin she became compensated and no longer complained of dyspneoa, precordial ache or ankle oedema. The dosage of vitamin E was reduced to 300 mgm. in nine days and the same digitoxin dosage maintained. Two days after first commencing treatment the patient's daily insulin was reduced to 15 units. Two days later to 10 units, and in seven days was stopped altogether. Two weeks after treatment was instituted she abandoned her diabetic diet and has continued absolutely free of urinary glucose ever since.

Case D: Mr. E. B.—white male of 68 years. He complained of precordial pain and dyspneoa. He gave a history of taking 20 units insulin per diem. He was diagnosed as coronary sclerosis with anginal syndrome and after July 9, 1946, he was given 600 mgm. mixed tocopherols per day. He promptly became much more active, could climb hills for a pastime, and his symptoms disappeared. Fortunately he was an unusually methodical person and kept a record of the fasting blood-sugar levels obtained by his doctor in Ohio, before and after our therapy had begun.

Date	*Blood Sugar*	*Insulin Dosage*
4-17-46	196	20 units
4-26-46	136	20 units
5-17-46	126	20 units
6- 8-46	79	20 units
7- 2-46	115	20 units
7-10-46	Commenced 600 mgm. mixed tocopherol per day	
8- 2-46	83	16 units
8-29-46	81	12 units
9-30-46	77	8 units
11- 1-46	61(!)	discontinued insulin

One year later he was still off insulin.

Case E: Mrs. A. B.—79 years, white. She had been taking 30 units Protamin Zinc Insulin plus 10 units regular insulin for 10 years. When first seen she presented a picture of arteriosclerotic heart disease with enlarged heart, coupling rhythm, mitral regurgitation, pulmonary oedema, paroxysmal nocturnal dyspneoa and chronic passive congestion of the liver.

Both legs were dark purplish-red in color and showed three plus oedema of a very soft character and were quite cold to the touch. The left great toe was a dark brown color and quite insensitive. There was no dorsalis pedis or posterior tibial pulsation in the left foot and only a faint dorsalis pedis in the right. The urine had remained free of glucose on frequent testing by her daughter. A diagnosis of arterio-sclerotic or diabetic gangrene was made.

She was given 360 mgm. alpha tocopherol per day, the dosage of digitalis was continued and she was admitted to the hospital the next day. The following day her legs were free of oedema and the color compatible with the rest of her body. The next day both dorsalis and posterior tibial arteries pulsated.

The following table illustrates the laboratory findings in hospital. It will be noted that the dosage of insulin was reduced to 20 and 10 the day the patient was first seen, and that three days later the blood-sugar had risen to 220 mgm. percent and the urinary glucose to three percent. From this we might conclude that the "immediate" effect of the alpha tocopherol upon the blood sugar required about four days in this case.

Date	*Urine*		*Bl. Sugar*	*Insulin*	
	Gluc.	*Alb.*		*PZI*	*Reg.*
11-17-47	tr.	3+		20	10
11-18-47	1 percent	1+		20	10
11-19-47	3 percent	tr.	220	20	10
11-20-47	0.7 percent	1+		20	10
11-21-47			190	15	10
11-22-47	tr.			15	10
11-23-47	tr.		172	15	10
11-24-47	tr.	tr.		15	10
11-25-47			162	discontinued	
11-26-47					
11-27-47	3 percent	tr.			
11-28-47	2 percent	faint tr.			
11-30-47	et seg	neg.			

DISCUSSION

Myself when young did eagerly frequent
Doctor and Saint, and heard great argument
About it and about; but everinore
Came out by the same door as in I went.

Omar Khayyam

The tent-maker might well have been thinking of either the pre-insulin or post-insulin phases of the treatment of diabetes when he penned these lines. No two diabetes specialists handle their diets and dosage exactly alike, and no two agree upon the relative weight to be attached to the various factors concerned in the disease. The anterior pituitary and the liver, as well as the pancreas, are supposed to be fundamentally involved in this condition.

The pancreas of some diabetics at autopsy shows no demonstrable gross or microscopic changes. The most common pathologic findings consists of hyalinization of the islets, probably (15) caused by production of an intracellular substance which interferes with the blood supply to the islets. This is a slowly progressive condition occurring in later life.

Another commonly found lesion is fibrosis. Wharton (13) found a definite increase of perivascular fibrosis in the islets after 40 years of age. He says this may progress from a single layer of fibrous tissue between the islets cells and the sinusoids, to replace almost the whole islet.

Alpha tocopherol must have an effect on fibrosis if it has been used successfully in cases of Dupuytren's contracture (14).

Before insulin, 63.8 percent of diabetics died in coma whereas today about three percent die in this state. However arteriosclerosis in its different forms has risen from 17.5 to 67.4 percent (16).

It is well known that diabetics are subject to arteriosclerotic manifestations at an earlier age than

others. Morgulis and Spencer (17) showed experimentally that E-deficient animals developed high blood cholesterol values, and also that vitamin E would lower these values. The role of cholesterol in arteriosclerosis is undeniable.

In many cases a deficient vascular supply to the beta cells of the islets must be an important factor. It is even possible that many diabetics are simply cases showing premature arteriosclerosis of these vessels. It has been shown (11) that, normally the blood supply to the islets is much more profuse than that to the acinar cells. Undoubtedly then, there must be a greater demand for blood for proper insulin production, and arteriosclerotic changes could be expected in some cases to reduce the supply below the level necessary to keep enough islet cells functioning to handle the glucose.

Previous reports (7) and (8) have demonstrated what salutary results large scale alpha tocopherol dosage has produced in many cases of arteriosclerotic heart disease and peripheral vascular disease. Any skeptical observer who has watched a patient with arteriosclerotic gangrene (7) walk out of the hospital in a few weeks on two good legs will henceforth adopt a strictly pragmatic viewpoint.

But there is more than the arteriosclerotic factor to be considered. It has been shown (18) that insulin inhibits gluconeogenesis from non-sugar reserves such as protein by inhibiting the action of gluco-corticoids formed by the adrenals by chronic stress. It may be that the alpha tocopherol as an antioxidant "reinforces" the action of insulin at first, and then later monopolises this function rendering the insulin no longer necessary.

Worton (12) in 1946 suggested that vitamin E with its known glandular stimulating action and effect on protein metabolism might be useful in diabetes mellitus.

As early as 1936, my colleague, Dr. E. V. Shute began to investigate the oestrogen metabolism (19) in diabetes, with the idea in mind of testing the effect of vitamin E upon them. Unfortunately however he was unable to pursue this project.

Whatever the mode of action may be, the author doubts that it will be understood until someone succeeds in producing a true experimental diabetes mellitus in animals. Certainly all that can be expected of a purely clinical physician is to note that the effect takes place.

Summary

Alpha tocopherol in doses of 200 to 400 mgms per diem radically lowers the insulin requirement in diabetes. After eight to twelve months of this therapy many patients require insulin no longer. Five cases are presented.

Acknowledgement

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SOME INDICATIONS FOR THE USE OF CONTACT LENSES

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Keratoconus

In this condition there is localized conical ectasia, with the apex of the cone usually just below the center of the cornea. The fixation axis passes through the obliquely disposed wall of the cone, and marked visual disablement results. The visual defect is due to three factors:

1. Irregular corneal astigmatism due to the obliquity of the cornea in the region of the cone.
2. Curvature myopia owing to the more acute

curve at the apex. Rays near the fixation axis are thus more acutely refracted.

3. Axial myopia, resulting from the increased distance of the anterior surface of the cornea from the retina.

Keratoconus is undoubtedly one of the most satisfactory and most successfully treated disorders for which contact lenses have been used because: by no other means can such excellent visual improvement be obtained. Spectacles will only correct the axial error, leaving the distortion unaffected. Visual improvement with spectacles is most unsatisfactory, whereas with a contact lens it may be described as miraculous without fear of being over-enthusiastic.

The incentive to wear the contact lens is therefore very great in patients with this condition and incentive is an important factor in the success or failure of contact lenses in any given individual.

Aphakia (Absence of Lens)

In unilateral aphakia correction with a spectacle lens is attended with two serious disadvantages:

1. There is a 25 percent difference in size between the images of the two eyes which results in difficulty in fusion and diplopia.

2. The presence of a powerful spectacle lens before the aphakic eye and a plano or weak lens before the other, introduces prismatic effects, so that diplopia may be increased.

Contact lens correction overcomes both these difficulties:

1. Prismatic effects do not occur because the lens accompanies the eye in all its movements, and the line of fixation is therefore always directed through, or very close to, the optical center of the lens.

2. Disparity of image sizes is greatly reduced because a convex contact lens of 15 dioptres reduces the retinal image by about 20 percent as compared with the spectacle-corrected image. In an eye which was previously emmetropic the disparity in size is thus reduced to about 5 percent by a contact lens and this amount of disparity is insufficient to prevent fusion. The advent of the contact lens has thus rendered possible the extraction of a unilateral cataract and correction of the aphakia, a procedure which was hitherto definitely contra-indicated.

Neuroparalytic Keratitis

In neuroparalytic keratitis contact lenses provide a decided improvement on former methods of treatment. In the first place, they may be employed as a prophylactic measure in those cases in which the onset of keratitis is to be anticipated. When the Gasserian Ganglion has been injected or surgical treatment carried out for trigeminal neuralgia, there seems little purpose in waiting for the onset, of ocular changes when they may be prevented by the use of a contact lens.

In cases where ocular changes are present or imminent, the surgeon has hitherto been confronted with the necessity to perform the disfiguring operation of tarsorrophy. Not only does the unfortunate patient become the object of curiosity among his or her friends and casual passers-by, but the cornea is hidden from view and the ophthalmic surgeon cannot readily observe its condition.

The use of a contact lens not only obviates the need for operative disfigurement and leaves the cornea accessible for periodic inspection, but, in those cases which have been treated by this method, has resulted in complete quiescence of the eye. Moreover, because of the corneal anesthesia, the lens is well tolerated, and can be worn with ease throughout the greater part of the day.

In conclusion, let me state, there are definite important indications for the use of contact lenses. To advise indiscriminately the substitution of contact lenses for spectacles is to risk bringing into disrepute a valuable form of treatment.

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Jewish Denver Hospital First To Provide Free Tuberculosis Instruction

The National Jewish Hospital, Denver, Colo., is the first hospital in the United States to provide free instruction in methods of tuberculosis prevention, control and treatment. This hospital received four World Health Organization fellows appointed by the WHO Interim Commission from various countries on July 1, and will study at the hospital for a period of six months.

Beginning January 1, 1949 the WHO will send 12 similar fellows to the hospital annually. They will obtain their instruction not only in the hospital, but at the University of Colorado Medical School, Fitzsimmons General Hospital, and other institutions in Denver noted for successful techniques in tuberculosis treatment and control.

Traveling and incidental expenses of these fellowships will be financed by the WHO. To cover the cost of living quarters and food during their stay at the hospital, an additional fund has been contributed by the International Foundation for Medical Research and Education. The Foundation, located in New York is headed by Dr. Edgar Mayer, chairman of the National Medical Advisory Board of the National Jewish Hospital, Denver, Col.

Editorials

Imagination, Life And Progress

Man has persistently exercised his imagination, especially in cosmology, since Thales, one of science's pioneers, first propounded his theories and predicted the eclipse of the sun in May 28, 585 B. C. some 2500 years ago. The events associated with this prediction are memorable ones.

On the Ionian shores of Asia Minor, Thales of Miletus (640-546 B. C.), having returned from Egypt where he studied with the priests, pursued his investigations which laid the foundations of geometry, astronomy, physics and philosophy. He was the first one to scientifically predict the total eclipse of the sun which occurred on May 28, 585 B. C. At the time a battle was in progress between the Medes and the Lydians, which was referred to by Herodotus as a "night battle." The eclipse caused immediate cessation of hostilities and a lasting peace between these two peoples.

By this successful prediction, Thales succeeded in destroying many unfounded myths and superstitions concerning the gods of healing, and taught that natural conditions, not demons and spirits, cause disease. In those days predictions were based on the opinions of oracles or on such things as the findings of the livers of slaughtered animals (haurispices). His prediction of the eclipse, which turned out exactly as he had foretold to the Ionians, clearly shows what an important part properly controlled imagination can play in the scientific world when the possessor thereof starts his conceptions and intuitions from the basis of scientific facts.

Einstein, whose theory of relativity started in intuition but became an accepted scientific achievement, when confirmed by the eclipse of 1919, has well phrased the importance of imagination, remarking that it is more important than knowledge, since the latter is strictly limited in its scope to actual known facts, whereas properly sensible imagination, being unlimited by such bounds, embraces the world and stimulates research.

Many of us can well use more properly directed imagination than we now possess.

Science Research as Cancer Integrator

As time goes on, physicians and many non-medical persons as well, have been impressed by the complexity of "the cancer problem." Medical men have been concerned more with the *cure* or *relief* of cancer than with the *cause;* for it is very evident that the cause will not be determined at the bedside, nor even in any single laboratory, but when the revelation takes place as it inevitably must, it will be a composite of the untold labors of countless workers who remain unknown.

This point of view is well set forth in a thoughtful article in *The American Scholar* for the spring of 1948. This is the authoritative voice of the American Phi Beta Kappa Society, and is published quarterly in New York City. The author of the essay which is entitled "Cancer Research: Integrator of the Sciences" is Dr. Paul A. Zahl, a biologist, who in 1936 joined Caryl Haskins in setting up laboratories for experimental work on cancer. The laboratories are supported, at least in part, by the National Cancer Institute and the United States Public Health Service.

To use Dr. Zahl's words, a "present-day broadside attack" is being made against the common enemy by specialists in all fields of Science. The problem is no longer to be considered a strictly medical one, although doctors should be given the hopeful results of crystallized opinion. Attempts at cure or even relief of humans should be left in medical hands no matter what agent is to be used.

Cancer is essentially "anarchy of cells." In the embryo, all cells are much alike at first. Then comes a period of differentiation in which special tissues are formed to build up special organs for special functions. When this process is completed, and size shape and position are thoroughly established, the creature is "born" and begins his earthly sojourn all the while attaining the characteristics normal for his kind. Then growth stops insofar as *size* is concerned, but *function* must go on undisturbed if good health is to be maintained. At this juncture we must look back and try to find out the nature of the forces which determines all this.

The limitation of growth to size commonly seen among humans is set down to the endocrines which are supposed to hold the reins against overgrowth and undergrowth, but there are giants and dwarfs whose characteristics always have been puzzling. Were

it not for cell subjugation, giants would be as numerous as stalks of corn in a field. What and where is the control process? If we knew that, we would be far on the road to understanding cell anarchy. We *do know* that embryonic "rests" often lie dormant in the body and serve no recognizable function. But through some stimulus of whatever kind they begin to grow, become vagrant and create havoc. They thrive at the expense of their fellows and destroy not only the society to which they belong but themselves as well. If these outlaws begin to multiply in the breast, we call the resulting piling up of cells breast cancer; if in the liver, liver cancer etc.

But this reversion to ancestral type (atavism) occurs in plants also. Fish, birds and amphibia have cancer. Outlaws exist in all forms of life, but how do they get out from under the rigid control agencies which hold all other cells in their proper groove? This unexplained revolt in the human body accounts for the death from cancer of one person out of every seven, and we are helpless in its prevention.

Therapy is limited to surgery, which is in reality a barbarous way of "curing disease", that is by cutting it out of the body; or we use radiation, (x-ray or radium) to destroy the anarchists. Quite often we can annihilate the enemy, but in doing so we destroy normal body cells as well. Moreover, we turn loose the "dead tissue" into the blood and lymph streams, and before being completely eliminated from the body, these agents may create havoc in previously normal organs. In this respect, surgery is the more rational procedure, but it often fails to reach *all* diseased tissues and organs.

Dr. Zahl recites four hypotheses which we may examine as possible explanations for the presence of cancer. First, cell changes may be brought about by some agency such as radiation or cosmic rays which strike somatic chromosomes, thus causing rearrangements of cells in a disordered pattern. Strictly chemical energies may also cause mutations.

The relation of heredity to cancer has long been studied in mice and rats with positive answers as to offspring receiving the "tendency" from parents. However, some mouse strains are immune to cancer for no definite reason, but others develop cancer in generation after generation according to known laws of heredity.

A second theory being tested by laboratory methods is based on the idea that "something has changed within the rigid control systems of the body." Breast cells seem subject to control by certain body hormones which originate the pituitary and the ovary. Some regulatory system must exist for every organ in the body. When it fails, chaos may be expected.

Thirdly, the old irritation theory has not been entirely given up. The familiar example of skin cancers occurring in the chimney sweepers of London will have to take a tumble into the discard in these modern days, but we still have the pipe smoker with cancer on the lower lip.

Fourth, it may be that the chemical nature of the irritant is complex, like a living virus, but so far this is elusive and chiefly theoretical. Such agents produce different kinds of cancers in frogs, chickens and rabbits. Mother's milk seems to carry the virus which enters the mouse quietly without any disturbing symptoms until in later life when mamary cancer develops. But if the "infected one" is nursed at the breast of a foster mother of cancer-free strain, no cancer develops!

Fifth, there may be "embryonal rests" already mentioned which do not share in the organization and differentiation of cells. These nonconformists cling to their original embryonic nature, and remain dormant for many years until activated by some unknown agency.

All of this is speculative, but it is necessary to set up theories and try to prove or disprove them if we are to make the ultimate Great Discovery.

Modern research is looking for "clues" of various kinds. One is concerned with changes in the normal body cells, -the why and wherefore of such changes. Another is studying the integrative changes of the functions of tissues and organs. Again, we may find a causative agent developing within the body itself, or being brought in from the outside through some unknown portal of entry. Danger is always present in generalizing from laboratory tests on mice for example, and seeking a perfect analogy with humans. Breast cancer in mice seems to be quite a different disease from breast cancer in the human female. Zahl states that carcinoma of the prostate is the only gland cancer which may yield to specific physiological therapy (?).

Cancer is more than a disease, -it is a condition of body cells out of control. For any solution of the "problem" we must go to chemistry,

physics, biology, -in fact to all realms of knowledge concerning the origin of life and its maintenance. The National Cancer Institute in Bethesda, Md., has all these divisions with many investigators at work in every known field. Integration of findings is absolutely essential to progress, and the study of cancer demands just that. Clinicians, in the last analysis, must apply whatever holds promise to the actual presence of cancer in human beings. It is for just that purpose that all this tremendous effort is being made.

William Briggs (1642-1704) And William Hyde Wollaston (1760-1825)

William Briggs was born in Norwich, Norfolk, England. He was a far seeing oculist and a pioneer in optics at a time when British ophthalmology was in a stagnant condition and its professors and practitioners relied for any knowledge of this coming medical science, upon European research men and practitioners. As the great physician, Caius, who dominated medicine in his day, Briggs was a native of Norwich and the greatest ophthalmologist living in Britain. His father was four times member of parliament for Norwich, at that time, among the four or five leading British cities.

William Briggs entered Corpus Christi College, Cambridge University at the age of thirteen and became a Fellow of his College in 1668. In France, he attended the lectures of Vieussens at Montpelier under the patronage of Ralph Montagn, British ambassador to France, afterwards, Duke of Montagn, and to whom Briggs dedicated his work *Ophthalmographia,* an anatomical description of the eye.

In 1677, the first part of his *Theory of Vision* was published. The second part was published in 1653. Both parts were published in the *Philosophical Transactions.* This work was translated into Latin and published at the express wish of Sir Isaac Newton, who wrote a preface acknowledging the benefit he had derived from the anatomical skill and knowledge of Briggs who held original and certainly sound views on several points in connection with the eye, for example, his recognition of the retina as an expansion in which the fibers of the optic nerve are spread out, another was his insistence that the hypothesis of the vibrations provided an explanation of the phenomena of nerves.

Again the aforementioned Latin treatise on the anatomy of the eye contained the first account of the optic disc. However, Briggs was more than a mere anatomist. He was inquisitive concerning the then many moot points with regard to the eye and thus his *Theory of Vision* is interesting showing the curiosity about these unknown points and the searching that was going on in the endeavor to unearth new, and if possible, correct explanations. Briggs was a great man and entitled to be ranked among the many great men in medicine and surgery who have adorned the Eastern counties of England.

William Hyde Wollaston (1760-1825), born at East Dereham some twenty miles from Norwich, a contemporary and friend of Thomas Young, was a Fellow of Caius College, Cambridge University. After a distinguished career there he became F. R. S. and was secretary and vice-president of the Royal Society. His published researches on optics and chemistry placed him among the leading scientific men of Europe. He published fifty-six papers in which it was said some advance was shown in each. Among these were papers on ophthalmology. In February 1924, having noticed that at times he saw one-half of every object with both eyes, he put forth the theory of semidecussation of the optic nerves.

He invented optical instruments, to wit, periscopic spectacles and in 1867 the camera lucida. He contributed also to theoretical optics. He enjoyed among the scientists of his day, in his own country and in Europe, a reputation for accuracy, combined with originality and was dubbed on this account the "Pope".

It may be stated without reservation that the Eastern Counties of England from which the pilgrim fathers, the first English settlers in America came, have done great service in aiding to pull medicine from the almost slough of despondency into which it had fallen and placed it, if not on a pinnacle, at least in a satisfactory position. Brigg's son, Henry, became a clergyman, chaplain to George II and rector of Holt in Norfolk, caused to be erected in the church a cenotaph in memory of his father. There is a street in Norwich of his name; however, it is most likely that it was named after his father, the member of parliament for Norwich. Then as now, scientific men are not so highly regarded as politicians except by the few, may it be said, discerning persons.

News Items

New Gadget for Vets With Paralized Hands Developed.—A simple devised plastic clamp that fits over the palm and provides support for a standard size cigarette holder has been developed to enable veterans with both hands paralized to smoke cigarettes with ease. Although the veteran may require assistance in placing the cigarette in the holder and lighting it, he should be able to smoke it without further aid.

The base of the clamp is a curved piece of plastic ¼ inch thick and six inches long, molded to slip over the knuckles and fit snugly around the palm of the hand. Two pieces of plastic—¾ inch square and 12 inches apart—are cemented to the upper side of the band.

A ¼ inch hole is drilled through each of the plastic squares. A cigarette holder is inserted in the holes, and the device is ready for use.

U. of Iowa Receives $22,000 in Research Grants.—Three research grants totaling $22,000 and two scholarships were accepted recently for the State University of Iowa by the finance committe of the Iowa State Board of Education.

Of the total $11,000 is a grant from the National Advisory committee for Aeronautics for an investigation of internal friction of single crystals to be carried on under Professor Tyndall of the university's physics department. Professor Emil Witschi will conduct research "Abnormality of Embryonic Differentiation and Neoplastic Growth Caused by Delayed Fertilization of the Egg." This will be carried on under a $6,000 grant from the American Cancer Society.

A $5,000 grant from the U. S. Public Health Service, National Advisory Cancer Council, was also accepted by the finance committee. The funds will be used for research in, "Malignant Disease of Oral Cavity and the Face." under Dr. Virgil D. Cheyne of the College of Dentistry.

Dr. Fishbein To Give Course in Medical Writing.— Dr. Morris Fishbein, editor of the *Jour. Am. Med. Assn.*, will give an instructional course in medical writing at the next annual meeting of the Mississippi Valley Medical Editor's Association, to be held at Springfield, Ill., September 29., during the Mississippi Valley Medical Society's yearly meeting. No registration fee will be charged to members of the Association.

The Medical Editors' Association is contemplating changes in both its constitution and name as it is felt that the name "Editors" is entirely too restrictive, and the name Medical "writers" or "authors" Association would be more appropriate. While every medical editor is a medical writer, every medical writer is not a medical editor. Since the principal purpose of the Association is to improve medical writing, hundreds of physicians should be interested in the organization, as most progressive physicians write articles and are interested in any effort to improve medical literature.

All interested in knowing more about this non-profit organization, or attending the meeting next September, should communicate with the Secretary, Dr. Harold Swanberg, 209-224 W. C. U. Bldg., Quincy, Ill.

House Approves New Heart, Dental, Polio Bills.—In a recent executive session House Interstate and Foreign Commerce Committee approved the proposed National Heart and Dental Research Act, as revised. Also, it indorsed and sent on to the House a new measure designed to project Public Health Service to poliomyelitis research and control on a scale comparable with its present activities in cancer, venereal disease and mental disease. All three bills were considered in conjunction with prospective National Science Foundation legislation. Apparently the committee is prepared to accept, if necessary, a Foundation without special heart, cancer, and polio commissions—as desired by the Senate, but the new measure has been drafted and approved to provide "insurance" of Federal support of polio research.

This new bill, flexibly drafted to authorize the Surgeon General to create institutes not only for poliomyelitis but for such other diseases as he may choose (arthritis, multiple sclerosis, cerebral palsy, etc.), reflects Sister Elizabeth Kenny's recent testimony before House I. and F. C. Committee.

Whooping Cough Mortality on the Decline.—According to Dr. William L. Bradford, associate professor of pediatrics, University of Rochester School of Medicine and Dentistry, whooping cough has experienced a declining mortality rate during the past 25 years, principally in urban communities. "In spite of the general decline in mortality," he pointed out, "it is fair to state that the case fatality rate among hospitalized patients under 12 months of age remains between 5 and 10 percent."

Statistically speaking, Dr. Bradford said that of the 10,730 deaths recorded throughout the United States (1938-1940 inclusive) 47 percent occurred during the first seven months of life. In New York State pertussis causes about six percent of the infant mortality rate. He advocated the more general employment of cultural techniques for the bacteriological diagnosis of whooping cough.

Chloromycetin—New Miracle Drug Tested by Army.—First reports from a United States Army test station, Kuala Lumpur, Malaya, on the most extensive experiment yet made with chloromycetin, the so-called miracle drug, give strong indications that this recently discovered antibiotic may prove as effective against *scrub* typhus as was hoped. This experiment has been eagerly anticipated as a potential landmark in

the history of medicine, for until the development of chloromycetin, even typhus vaccine had proved ineffective against a disease which was reportedly making serious inroads among native Malayan plantation workers.

Dr. J. E. Smadel, director of virus research at the Army Medical Center, Washington, (co-discoverer of chloromycetin) cautiously reported from Malaya on the first results of treatment of 25 native patients, compared with a small untreated "control" group.

Using controls composed of a similar number of Europeans, Malayans, East Indians and Chinese, Dr. Smadel and his group found that chloromycetin markedly reduced duration of fever, period of hospitalization, and incidence of complications in *scrub* fever.

The 25 patients to whom chloromycetin was orally administered averaged a fever period of 7½ days, developed no complications, and were hospitalized an average of 19 days. In addition, it was learned during the period of experimentation that both the duration and the amount of drug therapy could be materially reduced with results equally satisfactory to those obtained at the outset. The first patients received a total of 8 to 15 grams of the drug over an average period of six days; this was eventually cut to about 6 grams administered within a period of 24 hours.

Of the untreated control group, one died, one developed serious complications: the mean duration of fever was 18 days, and the average period of hospitalization was nearly 31 days.

U. of Nebraska Recipient of 4,000 Research Grant.—The Smith-Dorsey Company has announced a $4,000 research grant to the University of Nebraska Foundation. A study will be conducted by Dr. Ruth M. Leverton, nationally known authority in the field of nutrition research and director of nutrition research at the University of Nebraska College of Agriculture. Dr. Leverton will be assisted by G. R. Underwood, M. D. and F. S. Bukey, Ph. D.

Purpose of the study, according to Dr. Leverton, is to determine the comparative absorption from the intestinal tract of different iron containing compounds and their efficacy in hemoglobin regeneration. Dr. Leverton states that at the present time several dozen compounds are in use for iron medication and that an extensive control study of these different compounds used under similar conditions for human beings and administered at the same concentration of iron is going to be made.

Chicago Hospital Offers Expectant Fathers' Classes.—Thanks to the inaugeration of classes at the Lying-in hospital, Chicago, expectant fathers are getting an insight on ways of helping him to understand his wife during pregnancy and thereafter. The motto of the classes is "Make Maternity A Family Affair," and they are open to expectant fathers throughout the Chicago area.

Fathers' classes will acquaint the prospective father with the mental and nervous changes which are likely to occur when a woman is pregnant, while the process of burping, bathing and feeding the baby has also been put on the teaching agenda.

Diagnostic Manual Distributed to 76,000 Doctors.— Approximately 76,000 physicians in the United States have received a manual of information on the diagnosis and treatment of multiple sclerosis that has been prepared by the Medical Advisory Board of the National Multiple Sclerosis Society. In this 16 page manual, criteria are set up for a uniform standard of diagnosing multiple sclerosis, which is now considered by many medical authorities to be the major neurological problem of the present day. The manual also gives the newest information on rehabilitation and symptomatic treatment, as well as on treatments founded upon current theories of the disease.

In an effort to obtain news on the prevalence of the disease, the National Multiple Sclerosis Society is enclosing with the manual a letter to physicians asking that they inform the Society of the number of patients in their care who are multiple sclerosis sufferers, without revealing their names. This survey is the first of its kind and it is believed that if doctors provide this necessary, exclusively numerical data much progress can be made. One of the aims of the Society is to determine the prevalence of the illness as well as the influence of climatic and geographical distribution.

TB Handbooks Give Hope to VA Patients.— Patients with tuberculosis in Veterans Administration hospitals are receiving handbooks, "You Can Lick TB," designed to measure their progress from the time they enter the hospital until they are released. These handbooks contain basic, factual information about tuberculosis, as well as outlines for the development of individual rehabilitation programs.

To evaluate a patient's physical capacity, the booklet contains a section, "Your Record of Recovery," consisting of hour-by-hour time tables for each of the seven standard activity classes into which TB patients in VA hospitals are classified. The final section entitled, "So The Doctor Says 'You Can Go Home Now,'" handles summaries of the patient's plans for vocational education or a job; his personal, family or other problems or readjustment; his physical capabilities; and his requirements for post-hospital medical check-ups.

Physics Institute Puts Out Magazine.— The American Institute of Physics has announced publication of the first issue of its new semi-popular magazine, *Physics Today,* which is designed to interpret rapid strides being made in the science of physics. The monthly magazine is edited by David A. Katcher, physicist and

science writer, who reports that *Physics Today* is for the physicist, to inform him in comfortable, everyday language, of what goes on and why and who goes where. But it is also for the chemist, the biologist, and the engineer, to tell them of the science toward which they are driven by so many of their investigations. Katcher also said that the magazine is for the student, the teacher, the lawyer, the doctor and all who are curious about physics.

Municipal Hospitals Need 3,000 Additional Nurses For '48.—Because of the increasing demands being made on nurses for expert handling of new drugs and therapies, New York City's municipal hospitals need an additional 3,000 nurses during the year 1948 to 1949. Miss Mary Ellen Manley, director, division of nursing, Department of Hospitals, reported recently. "In spite of the recent introduction of the eight-hour day and improved salaries, we are still understaffed," Miss Manley said. "Today there are 5,500 nurse positions in the Department of Hospitals' budget, but the demands being made on nurses for expert handling of modern drugs and "shot" therapies are such that this number needs to be increased to 8,500."

Medical Reserves Extended to 300.—Authority has been granted to the Army Medical Department to immediately place three hundred additional Medical Service Reserve Officers on extended active duty. Reserve officers who volunteer will be assigned to duty in all four sections of the Corps, according to their qualifications. The greatest need is in theMedical Allied Science Section which included personnel trained in psychology, physiology, biochemistry, nutrition, serology and other related medical sciences needed in the Army. The other three sections of the Medical Service Corps are Pharmacy, Administrative and Supply Section, the Optometry Section and the Sanitary Engineering Section.

Plans are also being made to expand further the graduate training program for Regular Army Medical Service Corps officers. The program currently includes training at a number of civilian institutions in a wide variety of subject. A score of leading universities are cooperating in this training program, including Johns Hopkins, Harvard, Northwestern, Columbia.

Delicate Ear Operation Being Practiced at University of Iowa.—Eight to ten percent of the deaf people in Iowa and Nebraska could benefit from a delicate ear operation now being performed at the University of Iowa hospitals here, estimated Dr. C. M. Kos one of the few doctors in the country performing the operation. He is an assistant professor of otolaryngology in the University of Iowa Medical School. This operation is for a condition doctors call clinical otosclerosis, or hardening of the ear bones. The operation consists of drilling a microscopic hole within the ear by-passing the natural hearing window.

Surgeons doing this operation have achieved 60 to 80 percent success since its introduction about 10 years ago by Dr. Julius Lempert at the Lempert Institute, New York City. Dr. Kos, in explaining the consequent need for this operation, cites the condition which makes such a probing necessary. He says that around the stirrup bone in the window more bone may grow, causing the bone-in-window to become fixed. When sound is picked up by the outer ear, it goes through the drum, reaches the tiny chain of bones and is stopped. With the third bone unable to move, there can be no agitation of the fluid in the cochlea and no sound transmitted to the brain. Though no pain is caused as the result of this there is progressive loss of hearing.

Dr. Chisholm Speaks In New York At Community Service Society Meeting

Dr. Brock Chisholm of Geneva, and executive secretary of the World Health Organization Interim Commission addressed the Hundredth Anniversary dinner of the Community Service Society of New York, recently held at the Waldorf-Astoria. At this dinner he declared that because of the increased power to kill that has been developed in the last five years conditions of survival are centuries removed from even ten years ago.

"What has made the world a new kind of world is that warfare is obsolete as an instrument of human relations," he said, adding that "only a very small percentage of any major nation could hope to survive another world war."

Dr. Chisholm stressed the point that if there is to be a future for the human race all people must carry their share of the responsibility of the race to its descendants.

At a press conference the doctor announced that an additional amount of $1,000,000 had been made available by UNRRA to the World Health Organization for the first half of its activities in 1949. Speaking of the extensive work conducted by WHO in the field of biological standardization, he revealed that an important discovery was made recently in Germany which allows hopes for a considerable increase of world production of insulin. The new discovery, if it actually proves practicable, would make it possible to produce insulin without refrigeration of the animal pancreas glands during transportation to the processing centers. The WHO Interim Commission is collecting further data on this discovery.

LETTER FROM BRITAIN

(From Our Own Correspondent)

British National Blood Transfusion Service

During the last June quarter 27,546 new donors joined the British National Blood Transfusion Service, twice more than in the first quarter and blood was given by 66,557 donors. At the present time there are about 350,000 donors on the panel. To provide for further increases in the demands for blood and plasma and to ensure that donors are not asked to give blood more often than once every six months, some 168,000 new donors are required in England and Wales.

Hospitals

It has been outside Britain that hospitals have increased in size. In the United States some of these institutions are enormous. It is said that there is a tendency in the United States against units of more than 750 beds. In Britain thus far there are very few with 1,000 beds, in fact not more than one. These hospitals mainly owing to a shortage of nurses, have been compelled to close some wards or at any rate to restrict the number of in-patients to those who urgently require treatment and to emergency cases. The views of those who speak with authority appear to be opposed to large hospitals.

Aberdeen

Dr. G. F. Asprey, lecturer in botany at Aberdeen University, has been appointed to the Chair of Botany in the University College of the West Indies.

Belfast

The Senate of Queen's University, Belfast, has appointed Mr. A. C. Stevenson to the newly created Chair of Social and Preventive Medicine. Dr. J. E. Morrison has been appointed to the lectureship in Pathology.

Appointment

The British Minister of Food has appointed Dr. Norman C. Wright to be chief scientific advisor in succession to Sir Jack Drummond, F. R. S.

Medal Awards of Royal Society

Two Royal Medals of Royal Society have been awarded for the current year to Professor C. N. Hinshelwood, Dr. Lee's professor of chemistry, University of Oxford for his outstanding work on the mechanism of chemical reactions from the simplest gashouse processes to the complexities of cell division; to Dr. F. M. Burnet, director of the Walter Eliza Hall Institute for Medical Research, Melbourne, for his distinguished work on bacteriophage, viruses and immunity and for his contributions to the study of infectious diseases as an ecological phenomenon. Sir Edward Mellanby, secretary to the Medical Research Council was awarded the Buchanan Medal for his researches in the physiology of nutrition, especially in relation to the causation of deficiency diseases.

Death of Sir Almroth Wright

Sir Almroth Wright, 85, a great figure in medicine, passed away last year. His original researches on immunization, when put into practice, especially in connection with typhoid fever, saved many thousands of lives. Sir Alexander Fleming was his pupil and Lord Moran has said of these two men that they are "two doctors who have saved more lives in the army in the field than anyone else in the world."

Sir Wright obtained the medical travelling prize at Dublin University and stayed for some time in Leipzig, Strasbourg and Marburg taking his M.B., and B.Ch. at Trinity College, Dublin, in 1883. He received his M.D. in 1889.

Interested in bacteriology he worked at the laboratories of the Royal Colleges of Physicians and Surgeons where he made original investigations.

In 1887 he was made demonstrator of pathology, Cambridge University but still undecided as to his life's work went to Sydney as physiology professor at the University. In 1889 he returned to occupy the post of professor of pathology at the British Army Medical School, Netley, where he remained until 1902.

Haffkine had healed successfully some cases of cholera in India by bacteriologic inoculation, while Pfeiffer had two cases of typhoid inoculation. Wright followed up this form of inoculation by close research in regard to the dosage, strength and value of anti-typhoid inoculation in order to place it on a practical footing. He and Surgeon Major D. Semple, assistant professor of pathology at Netley, in January 1897 published a series of results obtained by them.

Wright had made his reputation as an original and somewhat unusual pathologist of an aggressive as well as defensive turn of mind who was able and willing to defend his views and findings which as all great advances did not meet with ready acceptance.

He developed the *opsonic index* by which he was able to graduate the dose of vaccine to fix the time it should be given and to measure the amount required for a given patient. During the South African War he was able to test his method of immunizing troops against typhoid fever. Results were satisfactory and similar satisfactory results were obtained among white troops in India.

In 1902 Wright was appointed pathologist to St. Mary's Hospital, London where the Institute of Pathology and Research was instituted under his direction. He was also professor of experimental pathology, London University. From 1914 to 1918 Wright served as consulting physician to the British Forces and owing to his methods and precept, the British, French and Belgian armies, witnessed the lowest typhoid rate on record.

Book Reviews

Nurse—Patient Relationship

A Psychology of Growth. By BERT I. BEVERLY, M. D. New York, N. Y.: Whittlesey House, 1947.

The publication of this book confirms an important human relationship between nurse and patient.

For the nurse it is essential that she have scientific and humane understanding of the patient so that her care will stimulate his continuing development to maximum capacity for living. She must understand what makes the patient into the person she finds. This understanding increases her usefulness as a member of the health team whose goal for the patient is preventive, therapeutic, or both.

From other sources the student of nursing has learned that at birth the infant possesses a pattern for physical development. From this book she learns, in addition, that he possesses a pattern for the development of mental and emotional health. She learns the characteristics of an environment which provides optimum development of the individual. Two primary attributes of this environment described at length by Dr. Beverly, are "security" and "standards appropriate to the age and characteristics of the individual."

In the care of children, both as mother substitute and as mother adviser, the nurse has a rich opportunity to assure the provision of this security and the appropriateness of these standards. In the care of the adolescent she deepens her understanding of the patient's behavior when she learns the extent of the security given him as a child and his reactions toward the standards held for him or developed by him. Her care of all patients is enhanced by her recognition of the two-way relationship between physiological reactions and intense emotions, rational or irrational. Knowing the psychological effect upon the individual of feelings of optimum security, of exaggerated dependence or rejection, the nurse comes to understand the degree of maturity of the patient. The concept of the "neurotic" sometimes improperly used by the nurse—is brought into truer focus. She becomes less liable to errors in judgment and in handling of patients, and she will learn to ease the "inevitable tension that leads to mental and emotional distortions." The role of anxiety and of illogical prejudices in the development of her patient's personality sometimes explains his behavior to her and enables her to give him more effective care.

In addition, the student who uses this book will find fundamentals which will guide her in understanding her own behavior. She is given concepts worthy of thorough study as applicable to herself. The instructor who encourages self-directed learning in her students will provide opportunity for free consideration and manipulation of these concepts by each member of the class. She will stimulate the student's search among the sources listed as references.

Achieving insight into her own reactions will improve the nurse's relationships with her patients, their families, her co-workers, and her friends. The development of an objective attitude toward behavior—her own and that of others—will make her a more effective agent for the promotion of positive health through caring for patients, through health education and through assumption of effective citizenship activities.

General Practice

Treatment in General Practice. By HARRY BECKMAN, M. D., Professor of Pharmacology, Marquette University School of Medicine, Milwaukee, Wis. Sixth edition. Philadelphia & London: W. B. Saunders Company, 1948. Pp. 1129. Price $11.50.

In this new edition the author combats the erroneous therapeutic credo of the young practitioner. It contains two articles, one that there are certain therapeutic principles which need be handled entirely in the management of a particular disease, and the other, that the art of treatment is natural if one has mastered the art of diagnosis. These false foundations of current therapeutic practice are shaken in this admirable text. It embodies recent advances in the treatment of internal diseases. Progress is ruthless, requiring inclusion of new entities such as: Balantidiasis, Coccidiosis, Colorado Tick Fever, Creeping Eruption, Geotrichosis, Listerellosis, Loeffler's Syndrome, Management of Penicillin Reactions, Melioidosis, Mite Infestation, Moniliasis, Newly Differentiated Anemias, Non-Meningococcal Meningitides, North Queenland Tick Typhus, Pulmonary Aspergillosis, Reiter's Syndrome, Rickettsialpox, Thrombosis and Embolism.

The book condenses the original work of authors in terms of the art and science of treatment of everyday diseases. The chapters include infectious diseases: fluke and worm infestation, allergic disturbances, endocrine and metabolic disorders, diseases of the gastro-intestinal tract, liver and bile passages, the respiratory tract, the circulatory system of the blood, genito-urinary systems, the nervous system and the skin. There are also chapters on disturbances caused by excessive heat, eclampsia, geriatries, poisoning, shock, crush and blast syndromes and sulphur and penicillin reactions.

There are, however some addictions to ancient concepts such as primary and secondary purpura. Actually idiopathic thrombocytopenic purpura is primary, while all others are secondary. Indeed, the purpuras have more recently been classified in terms of purpura due to actual lowering of blood platelets in contrast of purpura due to injury of the vessel walls. There is also less emphasis on nutritional therapy than current medical practice dictates. The book is a

veritable mine of well condensed information of therapeutic procedures invaluable in everyday practice.

Oil—Perfumery Industry

The Essential Oils. By ERNEST GUENTHER, Ph. D. Volume I. New York, N. Y.: D. Van Nostrand Co., Inc., 1948.

Readers of the trade journals in the essential oil and perfumery industry and persons attending meetings of pharmacal groups throughout the world know of the extremely fascinating work and the man behind the job of this new book. Nothing like it has been published-certainly not in English and not within this century.

In this, the first volume, Professor George Urdang, the eminent historian of all things pharmacal presents a masterly review of the scientific and near scientific aspects of odor through the centuries. Among a host of well known names-one remembers Dumas and Kekule with affection; and Paracelsus with admiration—the very name essential oils comes from his concept—the Quinta essentia.

A. J. Haagen-Smit, professor of bio organic chemistry at Pasadena tells of the chemistry and function of essential oils in plant life. The last is of prime interest to all physiologists and opens an entirely new vista. Certainly, fungicidal and bacteriocidal effects have been known, and in the day before the abiotics, some essential oils were utilised in medicine and some continue to be utilised. We do not yet possess the ideal remedy for the worm infestation for example.

Edward Langenau of the Fritzche Brothers analytical laboratories gives an exhaustive technical chapter on the examination and analysis of essential oils synthetics and isolates. Dr. Guenther has reserved for himself the chapter on the production of essential oils and reviews his actual field experiences. The book closes with lists of additional reading to the numerous footnote references and sections in an appendix on the utilization of the essential oils in modern life. Excellent illustrations are furnished, and tables give visual presentation to material.

The publisher and the author and editor are all to be congratulated. The physician in practice, the pharmacist in his work, and the manufacturing pharmacist will find something worthy and fruitful in the pages of the first volume.

Personality Development

Emotional Maturity. Development and Dynamics of Personality. By LEON J. SAUL, M. A., M. D., professor of clinical psychiatry, Temple University School of Medicine. Philadelphia, Pa.: J. B. Lippincott Co., 1947. Pp. xii + 338. Price $5.00.

The author intends to present fundamental basic facts concerning neuroses from which no one is entirely free. One must ask whether, after reading books of this kind, such freedom may be hoped for. Or may one become more "confused" and mentally disordered than ever?

This book deals with the feelings and desires as interrelated elements of human experience in daily thought and action. Emotional tensions are held up to the light and their fallacies are exposed in terms of actuality and the importance of taking a sane view of the world in general.

There are basic similarities as well as basic differences among men. Vulnerabilities and breaking points are illustrated in case histories, and the evidences of interplay of emotional forces are described. Emotional maturity stresses the rationale of clean living and high thinking, self-reliance and independence of thought as influencing correct behavior in relation to the rights and privileges of others as well as of one's own.

Tuberculosis

Tuberculosis. A Discussion of Phthisiogenesis, Immunology, Pathologic Physiology, Diagnosis and Treatment. By FRANCIS MARION POTTENGER, A. M., M. D., LL. D., F. A. C. P., emeritus professor of medicine, University of Southern California, the School of Medicine; medical director, the Pottenger Sanatorium and Clinic for Diseases of the Chest, Monrovia, California. Illustrated. St. Louis, Mo.: The C. V. Mosby Co., 1948. Pp. 597. Price $12.00.

The name Pottenger has been, for many years, fairly synonymous with the subject of tuberculosis. In his preface the author states that we have come to a point where old "truths" must be re-investigated and new concepts entertained.

He has learned much by trying to answer "Why's and "Wherefore's", and is impressed by the "mildly infectious" nature of tuberculosis, its tendency to heal spontaneously, and the cure of early cases through proper medical management. Streptomycin "gives more hope than any other remedy that has been suggested," but it is still in the experimental stage, and holds many dangers. Dr. Pottenger believes the dictum set down by a famous German that *"Jederman hat am ende ein bischen tuberculose"* (everybody has in the final analysis a little tuberculosis). Fortunate are those who have a mild attack in early life from which they recover and, therefore, establish some immunity for the advancing years.

As for vaccination with BCG, it is "logical, harmless and effective . . . It is now time that BCG be used in the protection of the exposed, the same as mass-tuberculin testing and mass-x-raying are used in finding the infected." This is the final sentence in the book.

Six chapters are given over to the genesis of tuberculosis.

Chapters XII to XIX deal with Diagnosis. Five chapters discuss "complications," eight deal with "treatment." Chapter XXV sets forth diagnostic and therapeutic principles in clinical practice, with case histories. The final chapter outlines a "Future Program."

One might wish that more details had been forthcoming concerning the *biochemistry* of the tubercle bacillus. This reviewer has felt for a long while past that we shall make little progress until we study the tubercle bacillus from every angle. Then we shall be able to direct our

weapons against the enemy. This is especially true of the "waxy capsule" which is the armor of the bacillus. When we learn how to break this down, and expose the cell to natural body defenses (especially to the mononuclear corpuscles of the blood) we shall be well on the way to cure all but the most advanced lesions.

This is an excellent book—the result of a ripe clinical experience.

Personals

Dr. William Reid Morrison, internationally famous surgeon of Boston, has accepted the post of chief consultant for surgery of Veterans Administration, having resigned as national surgeon general of the Veterans of Foreign Wars.

Dr. Morrison, one of the founders of the American Board of Surgery and for many years an outstanding teacher in medical schools, including Harvard and Boston University School of Medicine, will devote a major portion of his time to the surgical problems of veterans.

Dr. Charles Gordon Heyd, past-president of the American Medical Association was elected chairman of the board of directors and president of the United Medical Service. This service is sponsored by the Medical Society of the State of New York and 17 county medical societies.

Dr. Adolph L. Sahs has been elevated from acting head to head of the department of Neurology in the University of Iowa College of Medicine. The doctor held a Rockefeller Foundation Fellowship in 1938-1939 in neurology. He joined the staff of the neurology department in 1933 as an instructor and rose to the rank of full professor in 1946 .

Also at the University of Iowa is noted the appointment of an assistant professor of pediatrics in the person of *Dr. Raymond R. Rembolt.* Dr. Rembolt is the director of the State Services for Crippled Children and medical director of the School for Severely Handicapped Children. Following four years in the navy, Dr. Rembolt served as an assistant resident on a volunteer basis at the University of Iowa hospitals for one year before taking up practice in Lincoln, July, 1947. He interned in pediatrics at the University of Minnesota.

Newly elected president of the New York University College of Medicine Alumni Association is *Dr. Henry M. Scheer,* a New York City physician for 33 years. Dr. Scheer, otolaryngologist, is the director and attending surgeon of the Ear, Nose and Throat Department at Gouverneur Hospital, N. Y., and adjunct professor in ear, nose and throat at New York Polyclinic Hospital Postgraduate Medical School.

Thomas R. Forbes, assistant professor of anatomy succeeds *Donald H. Barron* as assistant dean of the Yale School of Medicine in charge of student affairs.

Associate professor of medicine, *Dr. Elaine P. Ralli,* of the New York University College of Medicine, was re-elected president of the Women's Medical Association of New York City for a two-year term. Dr. Ralli is a member of the American Physiological Society, the Society for the Study of Internal Secretions, the American Institute of Nutrition and the New York Academy of Medicine. She is now in charge of the New York University College of Medicine's Metabolic Clinic.

A bronze bust of *Walter Reed,* conqueror of yellow fever, was unveiled at the Hall of Fame for Great Americans on the campus of New York University. Major Reed was sent to Cuba in 1900 when a yellow fever epidemic was raging with devastating effect among American troops in Havana. This Yellow Fever Board, headed by Reed, was aimed to give special attention to questions relating to the cause and prevention of yellow fever.

Reed proved that the mosquito served as an intermediate host for the parasite of yellow fever, becoming infected only if it bit a patient during the first three days of the disease. He also demonstrated that an interval of at least 12 days must elapse after contamination and possibly longer.

Newly appointed director of bacteriology at Cook County hospital, Chicago, is *Dr. Oscar Felsenfeld.* Dr. Felsenfeld has just returned from the Caribbean area, where he spent seven months in a study of intestinal infections.

The William Withering Memorial Lectures at the University of Birmingham, England, were delivered this month by *Dr. John F. Fulton,* noted biographer and chairman of the Yale department of physiology. Dr. Fulton spoke on the physiological basis of the surgical operation known as frontal lobotomy, which has achieved increasing international interest in recent years.

His addresses were received with marked interest since the more enthusiastic advocates of the brain operation in Britain believe that, through its use, it may be possible to cut down the population of mental hospitals from one third to one half.

The William Withering Lectures were established at the University of Birmingham Medical School in honor of one of the university's most distinguished graduates who discovered the action of the drug digitalis in 1785. Last year the Withering Lecturer was professor Albert von Szent-Gyorgi, Hungarian medical research worker who received the 1937 Nobel Prize for Physiology and Medicine for his isolation of vitamin C.

SURGICAL DIGEST

By RICHARD A. LEONARDO, M. D.

Rochester, N. Y.

Arteriovenous Fistulas Elkin and Warren reviewed almost 400 patients with this condition due to military injuries. Many of the patients had an enlarged heart, increased cardiac output and an increase in the blood volume, but after surgical correction of the fistula, these disturbances frequently returned to normal.

Paralytic Inguinal Hernia This condition is due to nerve injury sustained at time of a previous appendectomy. The patient is left with neuralgic pains in the involved area and later the partially degenerated (and hence weakened) muscles permit the development of a hernia. Fortunately, the condition is rare.

Gelatine Solutions for Transfusions When whole blood and plasma are not readily available, gelatine solutions may be used temporarily as an efficient substitute for the treatment of shock, according to the experiments of Levinson et al. on dogs.

Thrombosis of the Renal Artery This condition is one manifestation of a generalized arterial disease known as atheroma. The main renal artery or one or more of its important branches becomes completely occluded. Clinically, it occasionally simulates an acute surgical emergency of the intra-abdominal organs. Useless laparotomies have been performed mistakenly on several of these cases. If kept in mind, it can be diagnosed before surgery, and surely before autopsy.

Uterine Cancer According to R. E. Fricke, cervical cancer, except for a few, early cases, is a radiologic problem; whereas cancer of the uterine fundus can be handled better; in his opinion and in the opinion of the majority of surgeons, by radical panhysterectomy.

Milkman's Syndrome In this condition, described by Milkman in 1930 (but previously known as late rickets, hunger osteopathy, osteomalacia, etc.), there is the occurrence of characteristic, multiple, spontaneous and idiopathic fractures. Ribbon-like zones of decalcification also are present; these are termed "pseudofractures," and are considered by some authorities as pathognomonic of Milkman's syndrome and that they are related to the underlying osteomalacia.

Cancer of Uterine Fundus This can be treated by Wertheim's panhysterectomy or by radium and roentgen radiation, or by a combination of both methods. If surgery is resorted to, the operator should be one skilled in this procedure, and likewise, not all radiologists are competent and/or equipped to handle many of these cases properly. Finally, preoperative care is of the utmost importance, especially the vaginal clean-up, the chemotherapy and the anesthesia; competent postoperative care also is needed.

Treatment of Hypertension For patients with malignant hypertension, if the renal impairment is not too great, Rogers and Palmer feel that surgical therapy (dorsolumbar sympathectomy) is twice as good as medical treatment, at least for the first three years. By that time, half of the surgically treated cases may suffer a relapse. Personally, I am not yet convinced that surgery, as practiced today, will have a permanent place in the treatment of the average case of malignant hypertension, and especially for the benign hypertensives who temporarily seem to be getting worse. However, time will tell.

Penicillin Sensitivity It is a well known fact that occasionally one encounters a patient highly sensitive to penicillin, so much so that in some cases the treatment is worse than the disease. Peck et al. have demonstrated recently that such patients may be desensitized successfully so that, subsequently, large amounts of penicillin may be administered safely.

Valentine Mott April 25, 1865, marks the date of death of one of the most famous surgeons ever to practice in New York City. He taught at the medical department of Columbia, and at Rutgers Medical College. After completing his medical studies at Columbia College (in 1866) he studied with Sir Astley Cooper in England, then one of the world's leading surgeons. Dr. Mott was especially skillful in ligating the great vessels in the treatment of aneurysms. He became professor of surgery at his alma mater when only 26 years old. During the years of 1840 to 1850 he occupied the chair of surgery at New York University Medical School. He had the courage to ligate the innominate artery only two inches from the heart in 1818 for the treatment of aneurysm of the subclavian artery and this was the first such operation ever to have been performed. While abroad, Mott was asked to operate upon the Sultan of Turkey and at that time he was considered one of the leading surgeons of the world. His contributions to American surgery have been numerous and of great importance.

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JUNE-JULY, 1948

Medicolegal Notes

Right of Examination Before Trial in Malpractice Actions

An action was brought against the executor of a deceased physician's estate to recover damages for personal injuries alleged to have been suffered by the plaintiff in the course of surgical and medical treatment by the deceased doctor. Three causes of action were alleged: (1) for breach of alleged contract for medical services made in 1927; (2) for malpractice based on treatment between 1927 and 1944; and (3) for malpractice based on an incident occurring in 1936.

The New York Supreme Court issued an order for the examination before trial of the defendent, individually and as executor, concerning medical treatments by the deceased between 1927 and 1944. On appeal by the executor, this order was affirmed by the Appellate Division, Mullane v. Crump, 71 N. Y. S. 2d 40. The court gave its reasons for its decision in a Memorandum, substantially as follows:

The doctor died in 1945, after this action had been begun by the plaintiff on reaching her majority. The examination was held properly admitted notwithstanding that any claims for alleged malpractice occurring prior to September 1, 1935, had abated under chapter 795, New York Laws of 1935, amending Section 118 of the Decedent Estate Law, which took effect September 1, 1935, and is limited to causes of action arising after that date. In 1935 the rule that causes of actions of this type abate upon the death of the wrongdoer (Hegerick v. Keddie, 99 N. Y. 258, 1 N. E. 787, 52 Am. Rep. 25) was changed by the amendment in so far as regards causes of action arising after September 1, 1935.

So far, therefore, as the third cause of action was concerned, the examination was proper, since that cause of action accrued in 1936.

The second cause of action concerned alleged acts occurring between 1927 and 1944. As to this cause of action the court said: "It cannot now be determined when the alleged wrongful acts occurred that are involved in that second cause of action, and the extent, if any, that they are affected by the doctrine of abatement. Testimony in respect of treatment prior to 1935 may be pertinent to shed light upon the propriety of the treatment after that date. Accordingly the examination was properly allowed in its present scope, conforming as it does to the second cause of action."

The first cause of action admittedly accrued in 1927. Despite its peculiar form, for breach of contract, with a request for damages for personal injuries, it is, the Appellate Division says; "in substance, an action for malpractice and is governed by the rules in respect of abatement applicable to such tort actions. Frankel v. Wolper, 181 App. Div. 485, 169 N. Y. S. 15, affirmed 228 N. Y. 582, 127 N. E. 914; Phelan v. Gibson, 148 App. Div. 925, 132 N. Y. S. 1143. As this alleged cause of action accrued in 1927, it abated upon the death of defendent's testator, since section 118 of the Decedent's Estate Law, as amended did not save causes of action which accrued prior to September 1, 1935."

Medical Service Corporation Contract Construal

In an action against a county medical service corporation to recover for the expense incurred by the plaintiff as the result of an operation performed by a member of the corporation, based on a contract by the corporation to provide the cost of medical and surgical service for a period not to exceed 26 weeks, the evidence was held insufficient to show an attempt by the corporation and the member thereof who treated the plaintiff to avoid liability under the contract by delaying a second operation until more than the 26 weeks had elapsed.

The plaintiff was an employee of a shipbuilding corporation and as such took advantage of the contract, becoming a contributor in 1942. At about

(*Continued on page* 380)

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11:00 P. M. August 1942, he became violently ill. The doctor was called and determined that an operation should be performed at once. An ambulance was called, plaintiff was rushed to a hospital, where the doctor operated and found a perforation of the bowels. The plaintiff recovered from the operation and in about five weeks returned to work. Thereafter he was subject to much pain and discomfort, frequently consulting the doctor, who prescribed a diet and told him to drink milk. On September 24, 1943, the doctor performed a second operation and removed a stomach ulcer. The corporation paid all expenses of the first operation, but refused to pay for the second; it was for this the action was brought.

Reversing judgment for the plaintiff, with instructions to dismiss the action, the Washington Supreme Court, Schultz v. King County Medical Service Corporation, 24 Wash. 2d 432, 165 P. 2d 857, said that, after a careful study of the statement of facts, the court could not find any evidence to support the plaintiff's contention that the doctor and the corporation purposely "attempted to avoid any liability for considerable expense by putting the respondent off, week after week, and not performing the operation which was necessary to effect a cure, putting him off until 26 weeks had expired."

The corporation argued that under its contract it was not compelled to pay for treatment of a disease for a period longer than 26 weeks; that the ulcer was a pre-existing sickness, for which it was not liable. The court said that neither the jury nor the members of the appellate court were able to determine the proper treatment of plaintiff's ulcer. The court continued: "The doctor attempted for over a year to cure respondent, but finally had to perform the operation. We cannot determine, in the absence of medical evidence, and there was none, that the operation should have been performed within the period mentioned in the contract."

The court therefore sustained the corporation's contention. The doctor who treated plaintiff testified: "It was a chronic ulcer; a lot of scar tissue. It evidenced that it had been present for several years." Medical testimony showed, the court said, that many people have ulcers of the stomach and never have any trouble or pain to indicate that they have the condition, which at a later date becomes acute.

The Schultz Case and the case of Jacobsen v. Kings County Medical Service Corporation, 23 Wash., 2d 324, 160 P. 2d 1019, were discussed and distinguished in McCarty v. Kings County Medical Service Corporation, (1947) 175 P. 2d 652, 668.

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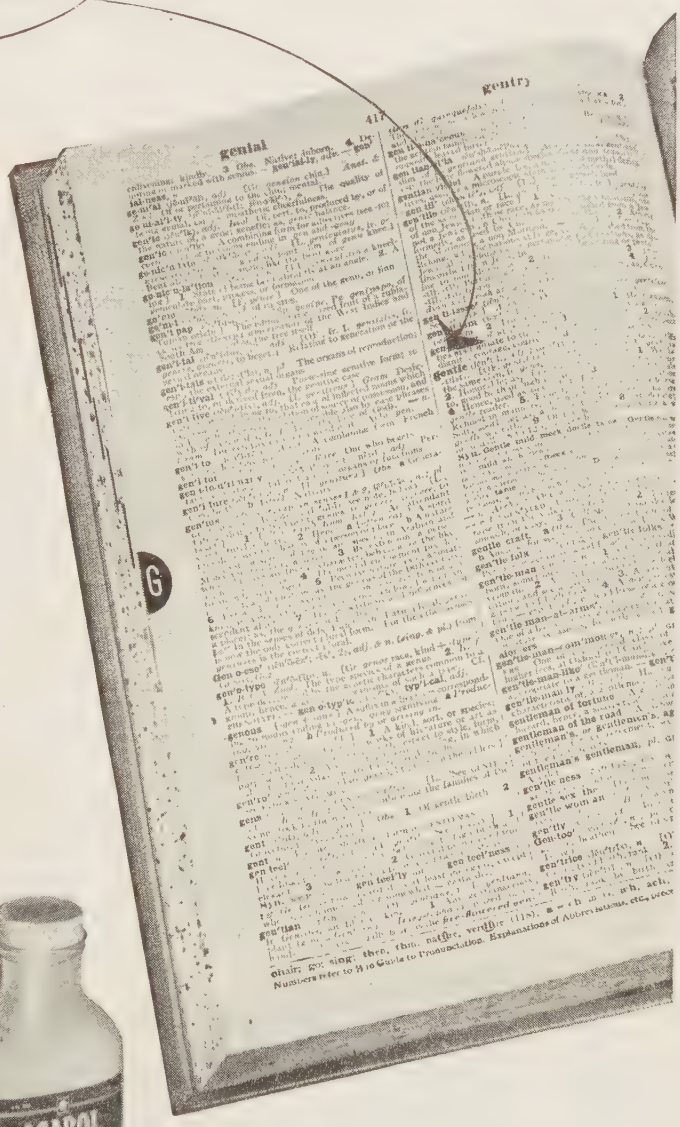

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INDUSTRIAL HYGIENE DIVISION INVESTIGATION LISTS STEEL HEALTH HAZARDS OF SODIUM FLUORIDE

An environmental study of the potential health hazards which might be associated with the use of sodium fluoride at open hearth furnaces, was recently conducted by the Industrial Hygiene Division of the United States Public Health Service as requested by representatives of the Republic Steel Corporation and the United Steelworkers of America.

Field work was conducted from January 7 to February 8, in four Republic Steel Corporation plants in Ohio. Medical examinations were made of 350 males, including 24 Negroes, distributed as follows: 187 in two plants now using sodium fluoride, 63 in a plant where sodium fluoride formerly was used and 100 in a plant which had never used sodium fluoride.

A total of 149 air samples, 16 settled dust samples and nine control samples, were collected. Laboratory investigations included determinations of the following in the air: fluorine, total fume, oxides of iron, and manganese. X-ray diffractions were made of fume and dust. Urine samples were studied to determine their fluorine content.

The medical study included a detailed occupational history, and a record of past diseases, operations and injuries. Present symptoms were recorded with special emphasis on fume irritative effects. A complete physical examination was performed with attention directed towards any evidence of lens opacity and inflammation of the mucous membranes of the eyes, nose, and throat.

Each worker was given a 14 by 17 inch x-ray of the chest, as well as an x-ray of his left wrist and forearm. Urine was examined for albumin and sugar. Red and white blood cell counts, hemoglobin determinations, serologic tests for syphilis, and leucocyte differential counts were made from the blood of each individual.

A clinical oral examination was made of each employee. Procedures used in these examinations consisted of critical inspection of all oral tissues and structures with the aid of two posterior bit-wing x-rays and lateral film of the lower left jaw.

Atmospheric concentrations of iron oxide, manganese and total fume were similar in all four plants. The maximum concentrations of iron oxide and manganese were well within safe limits. The weighted exposures to total fume were rather low, although certain jobs involved high exposures of moderate duration. Sodium fluoride concentrations in the two plants using it were similar in magnitude and had overlapping ranges.

With respect to both sodium fluoride and total fume, the cranemen had the greatest exposure and the pouring platform men were second. Weighted exposures to sodium fluoride for these two groups were 2.2 and 0.4 milligrams of sodium fluoride per cubic meter of air, and for all others they were negligible. Tar smoke and radiant heat were noted as discomfiting factors in need of correction.

In the light of present information such concentrations of sodium fluoride would not be considered hazardous. However brief exposures to the higher concentrations of total fume and dusts may irritate sensitive tissues of the nose, mouth and throat.

No significant physical defects could be directly related to the use of sodium fluoride. Upper respiratory symptoms such as cough were also not related to exposure but on the contrary occurred most commonly in the control plant. These symptoms might be attributed to the total fume and dust content of the air in all plants. The laboratory and x-ray examinations did not reveal any condition which might be linked to the use of sodium fluoride. From these findings it would appear that sodium fluoride does not constitute a health hazard under the conditions of this study.

Conclusions

1. Concentrations of iron oxides and manganese fumes were below the accepted maximum allowable concentrations and it is concluded that they would not constitute a significant health hazard.

2. When sodium fluoride was added to the molten steel in the molds or ladles, the compound was dispersed, without chemical change, into the working atmosphere. The weighted exposures of the workmen were not great enough, in the light of present information, to indicate any probable hazard of chronic toxic effects.

3. Acridine and other irritating factors in the smoke from mold coatings, during coating and pouring operations, were very irritating.

4. Discomfort caused by radiant heat was excessive.

5. Fumes, smoke and dust encountered at the open hearths induce an upper respiratory symptom complex which may be irritating and annoying.

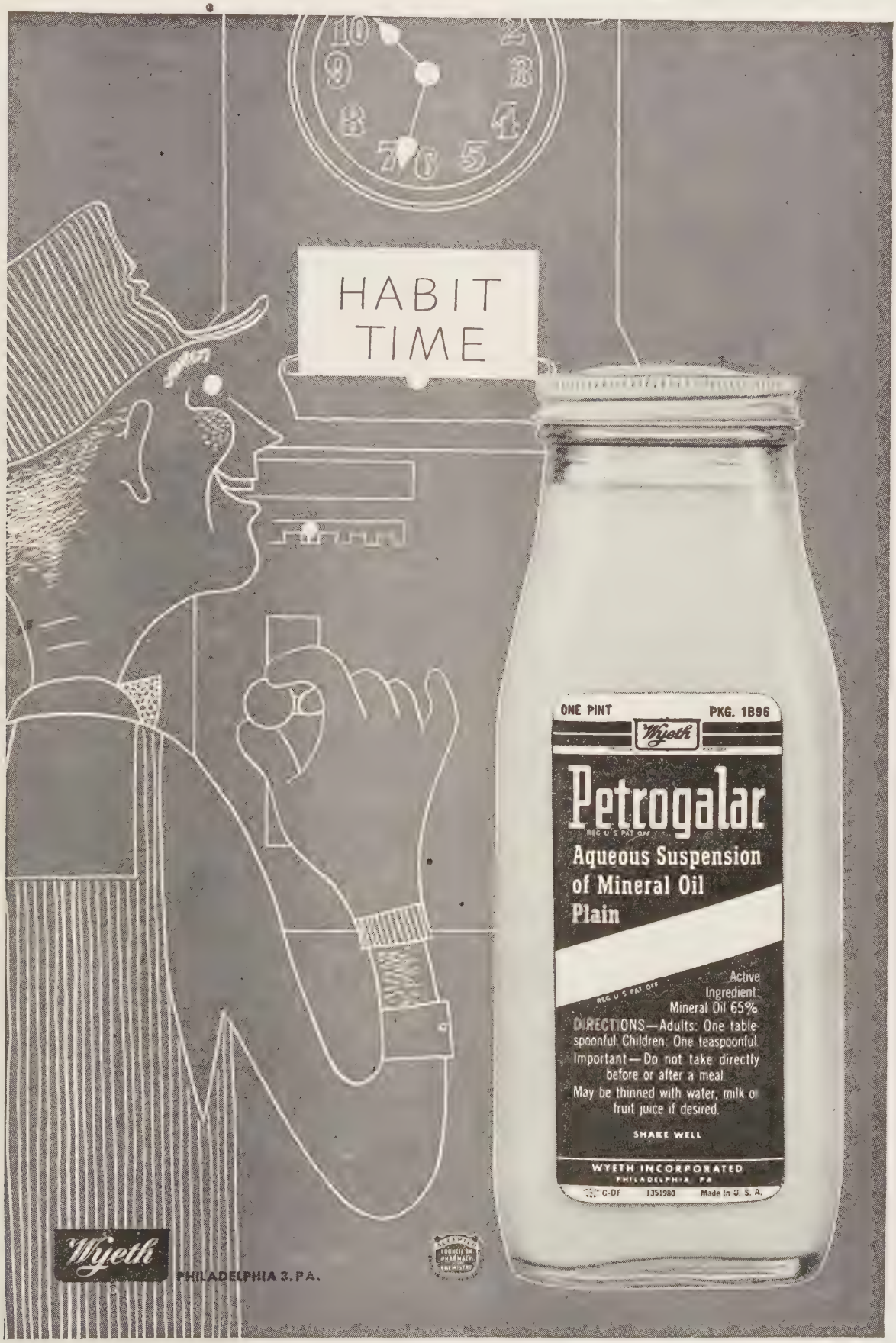
6. According to the data on symptoms by plants, there is an inverse relationship of the symptomatology to the exposure to sodium fluoride.

7. No severe pharyngeal damage results from exposure to sodium fluoride. A slight degree of pharyngitis may possibly be caused by sodium fluoride, tar smoke or sulfur dioxide fumes; it is difficult to separate the effects of these three environmental factors.

8. On a basis of physical and x-ray findings, there were no definite changes attributable to sodium fluoride.

9. Exposure to sodium fluoride has little or no disabling effect on the tissues and structures of the oral cavity. Sodium fluoride does not produce tissue necrosis when introduced into the oral cavity in atmospheric concentrations as experienced in the occupational environments which were investigated. However, sodium fluoride in combination with other fumes and dusts, may be a contributing factor in producing soft tissue inflammation in the mouth.

10. Repeated exposure to irritant factors in the occupational environment may produce increased thickening on vulnerable areas of the oral mucosae.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IOWA AND INDIANA UNIVERSITY CONDUCT BRAIN WAVE PROJECT

Playing leading roles in the State University of Iowa and Indiana University project question—"what goes on in your brain while you learn something new," are Dr. Winthrop N. Kellogg, Indiana Department of Psychology, and Dr. John R. Knott, of the Iowa State Psychopathic hospital.

The work is being done at Indiana University, in the specially equipped Indiana conditioning laboratory. Dr. Knott, who has spent 13 years studying in the field, is helping as a consultant on the brain wave side of the problem.

By attaching electrodes to the scalp of either human or animal subject, the electricity of the brain is carried through the skull and picked up by a complicated machine named an electroencephalograph. The fluctuations of electric voltage are amplified and recorded on a moving tape.

The learning process being studied is the "conditioned reflex" type, says Dr. Knott. While brain waves are recorded, the learning individual intermittently receives a weak electric shock; paired with the shock is the sound of the buzzer.

The shock causes the subject to move slightly, and special electrical apparatus measures this movement. Soon the subject learns to make the same movement with the sound of the buzzer alone.

"This test," explains Dr. Kellogg, "is deliberately simplified so that we can get at the fundamentals of learning. The question we ask is: Are there changes in the electrical currents of the brain that are related to stages of learning?"

The electrodes of the electroencephalograph machine are placed on the subject's brain at the point where the moving muscle is controlled. This way the response in the brain and the corresponding response in the muscle can be observed simultaneously.

This type of learning is carried through progressive stages. After nearly a year's work important facts are being brought out into the open.

While both scientists are approaching their study as pure research, they admit that they may possibly find factors applying to neurology and mental health, as well as to the behavior of the normal individual.

Original work in this direction was performed by Dr. Knott before World War II. A graduate of the University of Iowa, he has served at that institution receiving his Ph. D. degree in 1938. He is now a member of the board of editors of the International Journal of Electroencephalography.

The United States Public Health Service is also in cooperation with the two above institutions.

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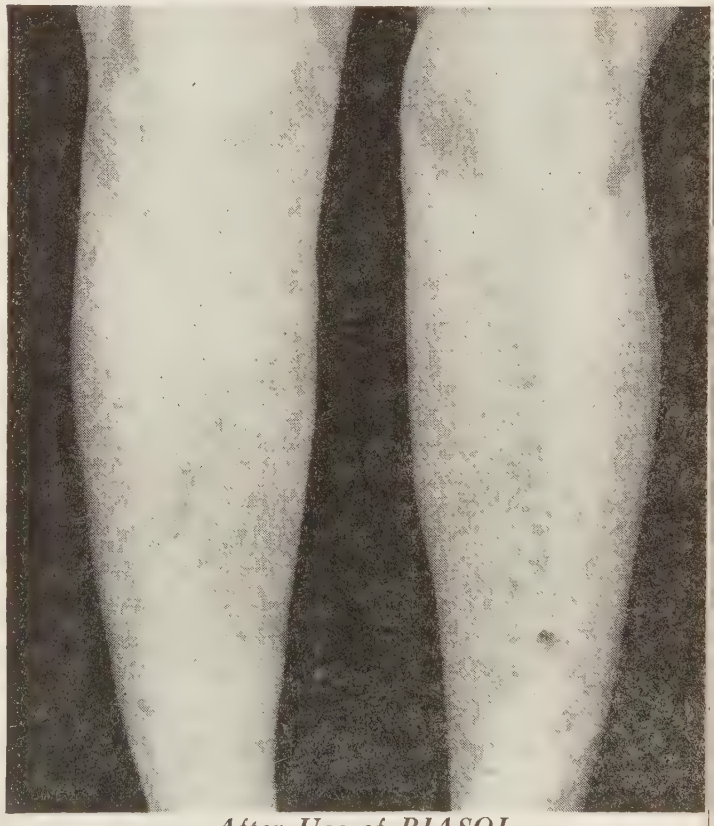

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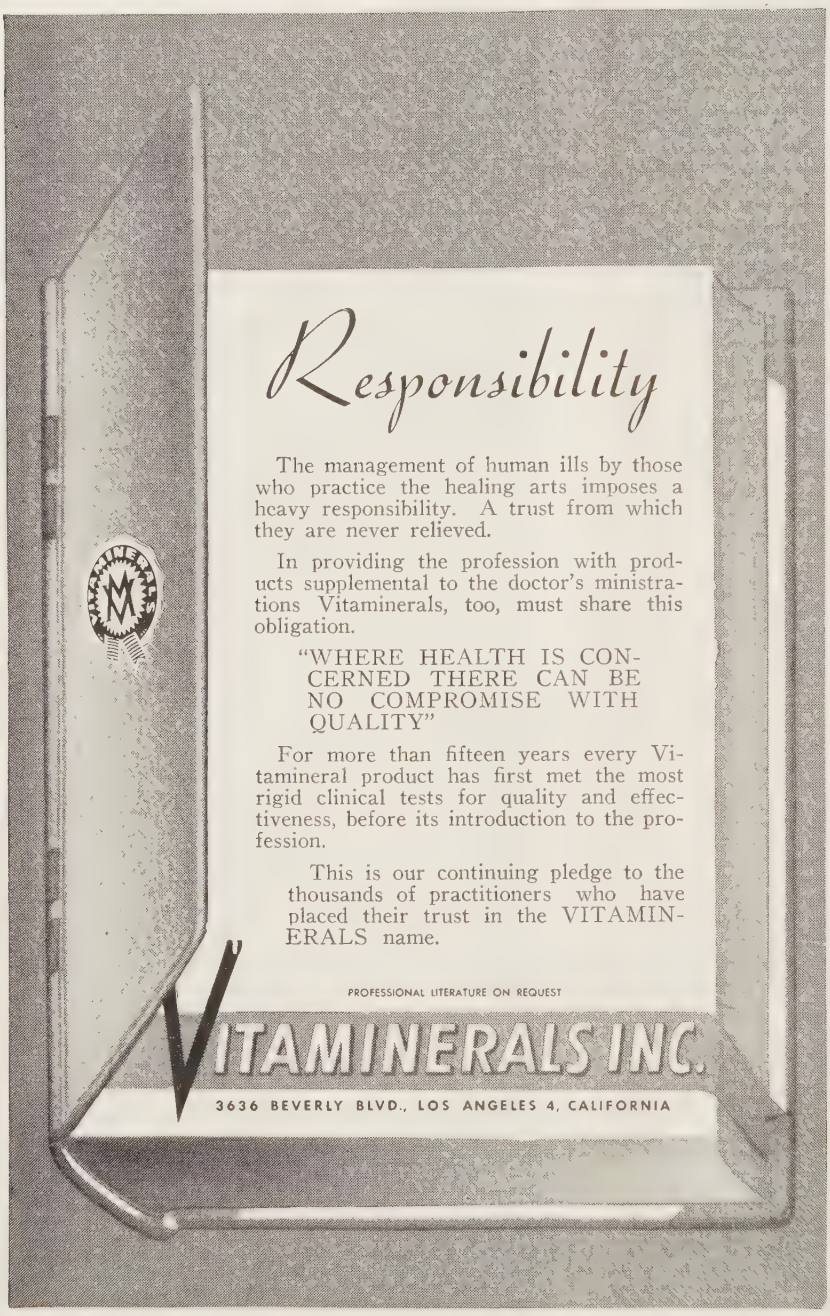
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Stanford Research Shows Vitamin "U" To Be Anti-Ulcer Factor

Dr. Garnett Cheney reports in a current issue of the Stanford Medical Bulletin, that a diet rich in vitamin U, found in raw foods and milk but deficient in heated foods, reduces peptic ulcer occurrence in guinea pigs.

However the scientist believes the results of his experiments conducted at the Stanford University School of Medicine, on guinea pigs warrant carefully controlled diet studies of human ulcer patients.

In his research the university clinical professor of medicine profited from earlier work in which he and other scientists had determined that vitamin U, the anti-ulcer factor, is found in alfalfa, kale, lettuce, cabbage and other fresh greens; cereal grasses; fresh milk and raw egg yolks; wheat bran; soybean and olive oils; and liver fat.

The San Francisco physician also took advantage of the fact that histamine, an organic amino compound, arouses a heavy flow of digestive fluids containing acid and pepsin, and produces a high incidence of ulcers in guinea pigs.

His research to test the effectiveness of diet in preventing histamine-induced peptic ulcers in guinea pigs, included three separate experiments in which guinea pigs were injected with histamine and then fed different diets.

In the first experiment, one group of guinea pigs was fed a diet made deficient in vitamin U by heating it. Another group was

(*Continued on page* 387)

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given the same diet, unheated and supplemented by liberal amounts of fresh cabbage and milk, both containing the anti-ulcer factor.

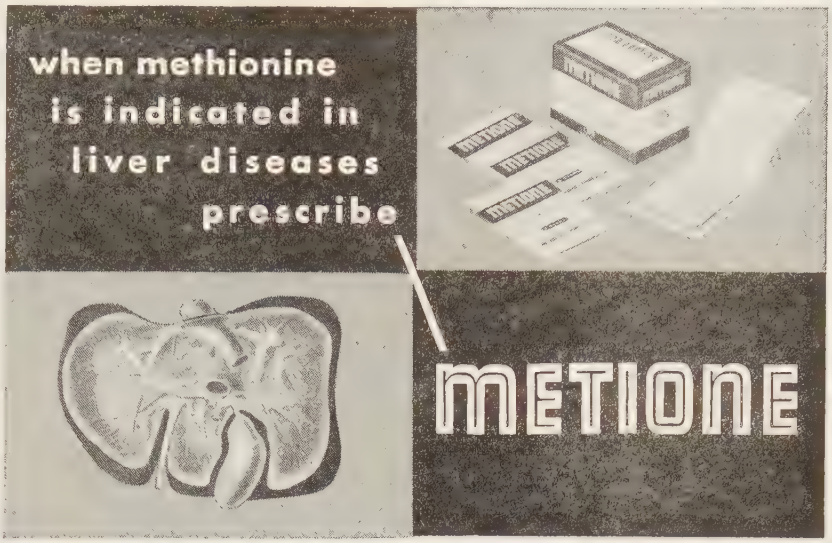
When the occurrence of ulcers in the two groups was compared, it was found that 87.5 percent of the group getting the deficient diet had ulcer lesions, all but two of them fatally. None of the guinea pigs on the protective diet had ulcers.

To emphasize the effect of heat in eliminating the anti-ulcer factor, two other groups of guinea pigs were fed an identical diet, except that the food of one group was heated and the other unheated. Ninety percent of the guinea pigs receiving the heated diet developed ulcers, while only 22 percent of the animals getting the unheated protective diet developed ulcers.

In a third phase of the experiment, designed to test the anti-ulcer activity of fresh greens, 14 guinea pigs were fed cabbage or lettuce in addition to a heated diet, while 24 other animals received the heated diet alone.

None of the guinea pigs fed the supplement of greens showed any signs of illness, while all but three of those on the heated diet alone developed peptic ulcers in 11 days.

Dr. Cheney, in commenting on the research which emphasized prevention rather than cure, stated that the fact that the anti-ulcer factor is so readily destroyed by heat brings up the intriguing question of whether or not the increasing number of patients with peptic ulcer may, in part be due to the heat processing of their food supply and their small intake of raw foods.



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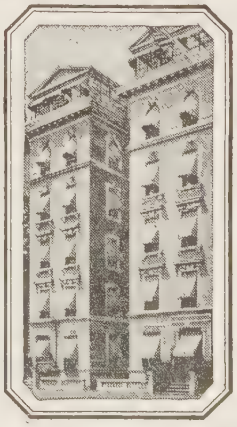

Personals

Dr. Louis M. Rousselot, associate in surgery at Columbia University College of Physicians and Surgeons, has been selected professor of clinical surgery at New York University College of Medicine and director of surgery at St. Vincent's hospital.

For the first time since the Passano Foundation was established in 1944, by the Williams and Wilkins Co., Baltimore, a dual selection has been made. The award goes to the famous *Taussig-Blalock* team who developed the successful operative procedure which is popularly known as the "blue baby operation." It also marks the first time that a woman has been named as an award winner.

Dr. Helen B. Taussig is associate professor of pediatrics and *Dr. Alfred Blalock* is professor of surgery at the Johns Hopkins Medical School. Since the first "blue baby" operation was undertaken in November 1944, more than 600 patients drawn from all parts of the world have been operated on at Johns Hopkins Hospital alone.

Dr. Stephen Rothman, professor of dermatology and syphilology, University of Chicago School of Medicine, delivered the 1948 annual lecture arranged by the Galen's Honorary Medical Society at the University of Michigan Medical School, Ann Arbor. The subject of the lecture was "Reactions of the Skin to Sunlight and Methods of Protection with Particular Reference to Para-Aminobenzoic Acid."

David P. C. Lloyd, Ph.D., Rockefeller Institute for Medical Research, New York, delivered the fourth annual John B. Johnston Lecture at the University of Minnesota Medical School. His subject was, "Monosynaptic Reflexes and the Myostatic Unit."

An experienced man in the field of public health and teaching in public schools is *Jesse Meuse,* who has been appointed Negro health educator for the Florida State Board of Health. As a member of the division of health information he will work with various groups in the promotion of better health among the Negro population of the state.

Due to the generosity of *Dr. Oscar T. Clagett,* an annual lectureship in surgery has been established at the University of Colorado Medical School. The first lecturer will be Dr. Owen H. Wangensteen, professor of surgery, University of Minnesota. Dr. Clagett is now chief of the section of thoracic surgery at the Mayo Clinic, Rochester, Minn.

The first annual Survey Award, presented by *The Survey Midmonthly,* for "an imaginative and constructive contribution to social work" was presented last month to *Dr. Howard A. Rusk* for his outstanding work in translating into civilian life what was learned about rehabilitation in the armed forces.

Dr. Rusk is director of the Department of Rehabilitation and Physical Medicine, Bellevue Hospital, N. Y.; professor and chairman of the Department of Rehabilitation of New York University; director of New York University's Institute of Rehabilitation. He is also an associate editor of the New York Times.

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SIR William Gull is medically recognized for his many original observations which led to his classic description of myxedema and a greater understanding of nephritis. He also added much to the fundamental knowledge of neuropathology—such as his observations that locomotor ataxia was a disease of the posterior columns of the spinal cord. Medical knowledge was greatly enriched by Gull's experiences.

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NEW PRODUCTS

Simplified Oxygen Analyzer Developed By Oxygen Corporation

A vital need in oxygen therapy is efficiently met in the new O.E.M. Simplified Oxygen Analyzer, developed by the Oxygen Equipment Mfg. Corp., 405 East 62 Street, N. Y. C. With this new-type analyzer, completely enclosed in transparent plastic to prevent breakage, an accurate analysis of oxygen content within the tent canopy can be made in less than a minute, thus permitting the frequent analyses so necessary to expert oxygen administration.

Adaptable for instant use with every type of oxygen tent, this improved O.E.M. Analyzer has an extremely simple "one-two-three" operation which demands no technical skill or burdensome detail work on the part of hospital personnel. The easy-to-follow directions are indelibly printed right on the analyzer.

The analyzer is exceptionally easy to clean and keep sanitary. Easily portable, it weighs only 2 lbs., 2 oz.

Pyridine Base Compounds Combat Allergic Symptoms

Dr. C. M. Suter, director of the chemical division of the Sterling-Winthrop Research Institute recently informed American Chemical Society members that among hundreds of compounds studied, several potent drugs, many stemming from pyridine, have been discovered to relieve what medicine defines as a "condition of unusual or exaggerated specific susceptibility to a substance harmless in similar amounts to the majority"

People, for instance, allergic to ragweed, or rose pollen, or even cat's fur, feathers, certain grasses, or any number of substances which others can take with ease, are due for long-sought relief, according to Dr. Suter.

"This new group of drugs may well contribute to the comfort of more persons than any other discovery since the barbiturates were first made available," Dr. Suter said.

He pointed out that one of the most important groups of newer synthetic medicinals are classified generally as "antihistamine agents," and explained that some years ago it became evident that there was a close relation between histamine, a stimulator of the autonomic nervous system, and allergies.

"Several potent drugs have now been discovered that counteract or interfere with the action of histamine," Dr. Suter continued. "Chemically these are all tertiary amines having two methyl groups attached to nitrogen. Most of the active compounds are also derivatives of 2-aminopyridine, which in turn is made from pyridine, a component of coal tar.

"Some of the antihistaminics are already in wide use for the control of allergic symptoms and others of promise are under intensive clinical trial," Dr. Suter concluded.

Speaking in general terms, Dr. Suter said "research in synthetic medicinals is making progress, particularly in the development of agents for the control of pain."

"With the end of the war, this research has assumed a more diversified aspect," he said, "and is again directed chiefly toward the health problems of this country rather than those of foreign areas.

"Most of the recent progress has been in new drugs useful in alleviation of discomfort or control of pain, rather than the cure of diseases caused by pathogenic organisms. New synthetic medicinals are now appearing on the market which represent the development of discoveries made during 1940-1945."

Hyotole Syrup Nationally Released By Sharp & Dohme

The national release of 'Hyotole' Syrup, a preparation which provides the major essentials for the treatment of iron deficiency anemias, was announced today by Sharp & Dohme, Inc., Philadelphia drug manufacturers.

Because of its liver content, 'Hyotole' Syrup is of value in stimulating voluntary food intake. Its palatability makes it particularly useful for young children with loss of appetite

This product provides iron in combination with the vitamin B-complex, choline, and folic acid, fortified with crude liver concentrate, in a pleasantly flavored preparation readily acceptable to children as well as adults.

Each 30 cc. (approximately 1 fl. oz.) contain: 1.3 Gm. Ferrous sulfate U.S.P.; 10 mg. Thiamine hydrochloride (vitamin B_1); 2 mg. Riboflavin (vitamin B_2); 1 mg. Pyridoxine hydrochloride (vitamin B_6); 2 mg. Calcium pantothenate; 30 mg. Niacinamide; 20 mg. Choline chloride; 5 mg. Folic acid; and crude liver concentrate derived from 90 Gm. of fresh liver.

Recommended dosage for adults and children six years of age or over is one tablespoonful of 'Hyotole' Syrup, followed by water, twice daily after meals; for children under six years of age, one teaspoonful, followed by water, three times daily after meals.

In the presence of severe anemias or vitamin deficiency states, the dosage may be increased in accordance with clinical judgment.

'Hyotole' Syrup is supplied in pint 'Spasaver' bottles, featured exclusively by Sharp & Dohme. It is also marketed in one gallon bottles.

New Sulfonamide Preparation For Incipient Colds

Schering has introduced an effective means for relief of nasal congestion incident to the common cold and of preventing complications in the form of Sodium Sulfacetimide Nasal Solution 10 percent.

Investigators reporting on this new sulfonamide nasal solution claim that it will even prevent colds if treatment is instituted early with the first symptoms of nasal irritation and dryness. Dr. David Haler in *Medical Press*, October 30, 1946, reported 80 percent success with this treatment in aborting incipient colds.

Sodium Sulfacetimide Nasal Solution 10 percent is an aqueous solution of sodium sulfacetimide with dl-desoxyephedrine hydrochloride 0.125 percent buffered to pH 7.4 It's penetrating powers, affects the nasal mucosa, and the action of the cilia is not impaired. "Sulfa-resistance" has not been encountered. The medication is not irritant. Ventilation results from the local action of desoxyephedrine. The nasal instillation of 1 to 3 drops, four times daily, at the onset of the earliest symptoms is the preferred treatment.

Sodium sulfacetimide in the form of 30 percent buffered solution has been recognized as the most effective agent in treatment of ophthalmic infections. Known also as sodium Sulamyd, it gained wide usage during the war as albucid soluble, the name by which Schering markets it in some countries.

Hearette—Unique Electronic Instrument Promoted By Dictograph Products

The Hearette, a revolutionary electronic instrument designed and engineered to bring hearing aid to approximately six to ten million people who have hearing problems, was announced today by Stanley Osserman, chairman of the board of Dictograph Products. Developed by the company's acoustican division, the Hearette is capable of increasing the power of sound delivered to the ear more than 100,000 times.

The Hearette is intended to be used by persons whose hearing loss is slight and who will benefit by an improvement in his hearing ability under certain conditions where the sound level is below that of the ordinary conversational level.

It is so compact that it fits easily into any pocket or lady's handbag. The user simply holds the Hearette to his or her ear and by pressing a button sound magnification is made possible by simple fingertip control. Among its features is the fact that there is nothing to wear. People don't have to be wired for sound or wear cords dangling from their ears, headbands pressing their heads or receivers inserted in their ears.

The Hearette is not intended as a fitted instrument but merely as an unobtrusive means of overcoming an unfortunate handicap. It also affords a unique use for the person with normal hearing who many times is confounded by acoustical defects in a theater, convention hall or other type of public place. Merely by placing the instrument to the ear and "tuning" in, the sound is amplified to such an intensity that a relaxing of the nerves is the result.

Acousticon engineers have designed a revolutionary instrument in this new product because they have created a single unit which comprises the microphone, receiver and power pack. They have also been able to overcome the problem of acoustic feedback which has been a basic one in the industry.

The Hearette has a total weight of only 8½ ounces and is contained in a specially engineered Du Pont Lucite case. The microphone, A and B batteries, two special midget vacuum tubes, a transformer, resistors, a capacitor and the volume control are contained in the case itself and the receiver is appended to the case by means of a clip. When the receiver is placed to the ear the case acts as a handle. The "B" batteries have a longevity capacity of approximately 340 hours with the volume control getting on ¼. This computation is based on an eight hour day of use.

"Although Acousticon manufactures different types of hearing aids which fulfill the needs of the hard of hearing. There are many millions of persons who have slight hearing losses and because of personal vanity will not avail themselves of the technical and mechanical means for perfect hearing," stated Osserman. "So that these people may experience the joy of good hearing, the Hearette has been designed so that it can be used simply and conveniently—merely by placing the instrument to the ear when a hearing "lift" is needed. The Hearette is intended to do for hearing what eyeglasses do for sight."

Capsule Aspirin New On Drug Market

Delvinal-Aspirin Vinbarbital and aspirin in capsule form, Sharp & Dohme product, makes its appearance on the drug market. This product, designed to relieve pain and nervous tension, combines the sedative properties of delvinal vinbarbital (a barbituric acid derivative with a short induction period and moderate duration of action) with the analgesic effectiveness of aspirin.

Each capsule contains 30 mg. (1½ grain) of 'Delvinal' 5-ethyl-5—(1-meyhl-1-butenyl) barbituric acid and 0.30 Gm. (5 grains) aspirin (acetylsalicylic acid).

'Delvinal-Aspirin' vinbarbital and aspirin is applicable especially in myalgic, neuralgic and arthritic conditions, particularly in hypersensitive, neurasthenic or nervous patients, or those

suffering from anxiety tension states.

It is especially useful in allaying fear and controlling pain preceding minor surgical operations.

The therapeutic efficiency of 'Delvinal-Aspirin' Capsules can be demonstrated over a wide field of clinical usefulness. It produces calmness, induces refreshing sleep without "hangover" on awakening, is a central nervous system depressant, and is relatively non-toxic.

One capsule of 'Delvinal-Aspirin' vinbarbital and aspirin administered orally every three or four hours is recommended for the average adult dose. In pediatrics and geriatrics the dosage should be regulated accordingly. The capsules should be administered not more than one hour prior to performing any surgical or dental procedure.

Capsules 'Delvinal-Aspirin' vinbarbital and aspirin are supplied in bottles of 100 and 1,000.

New Injectable Penicillin Announced By Schering

Schering Corporation of Bloomfield, New Jersey, has further extended its expansion into the antibiotics by the marketing of Procaine Penicillin-G Crystalline in Oil for intramuscular injections.

The advantages of this product over other types of penicillin preparations are many. In most instances only one injection of 300,000 units is required in 24 hours. Therapeutic blood levels are often maintained for 36 to 48 hours. A previous preparation containing wax resulted in unfavorable local reactions which have been eliminated through the use of the new procaine penicillin product.

The new medication has proved effective against the gonococcus, streptococcus, staphylococcus and pneumococcus, in addition to being of value in spirochetal diseases, bacterial endocarditis, meningitis, anthrax and actinomycosis. Prophylactically, it may be used prior to dental extraction and tonsillectomy to prevent secondary infection.

Crystalline Free Acid-My-B-Den Produced By Bischoff

Ernst Bischoff Company, Ivoryton, Conn., has announced the production of My-B-Den (adenosine-5-phosphoric acid) on a scale which insures its constant availability in a purer form than previously possible.

Adequate supplies of this unique compound are now available for the institution of clinical investigations as well as for the continuation of biochemical and bacteriological studies of enzyme systems and bacterial metabolism.

Adenosine-5-phosphoric acid is a purine nucleotide present in cozymase and the Warburg-type respiratory enzyme, and constitutes an essential link in basic life processes. Fundamental in phosphorylation reactions of biochemical systems, it plays a vital metabolic role in energy transfer and muscle action.

Recent clinical and pharmacologic reports emphasize the importance of extended and intensive investigation of its application to the treatment of vascular disturbances, cardiovascular disorders and degenerative diseases.

A typical preparation of this crystalline free acid shows a purity of 99.5 percent. Its purity is based on the adenine, ribose and phosphorus content and the molar ratios of these substances. The position of the phosphorus on the ribose in the 5-position is unequivocally established. No inorganic phosphorus is present.

New Tube Expected To Make Fluoroscope 500 Times Brighter

According to H. D. Moreland, manager of Westinghouse X-Ray Division, Baltimore, fluoroscopy is about to take its greatest forward stride since the development of the Roentgen tube, with the presentation of a new tube expected to increase the brightness of fluoroscopic images by 500 times.

The fluoroscopic x-ray image amplifier now being constructed at the laboratories is based on information gained in four years of intensive study resulting in the actual amplification of an x-ray image. Basically it will consist of a high vacuum tube that electrostatically focuses and accelerates an electron stream. When perfected, the device will take the form of an attachment for standard fluoroscopic equipment.

The need for this product is imperative since the conditions that confront the physician in present day fluoroscopy are even worse than those encountered in finding a seat in a movie after leaving the bright outdoors. To see the fluoroscopic image he has to dark-adapt his eyes for twenty minutes.

Increased brightness of the x-ray image has been attained by converting the x-ray quanta into light with a fluorescent screen and thence to electrons by means of an adjacent photo-electric surface. These electrons are accelerated by a high potential placed across the vacuum tube, giving a brightness gain of 20 times. A further factor of 25 in brightness gain is attained by electrostatic focusing of the electron stream to reduce the image to 1/5 of its size.

The reduced image, now brightened 500 times, impinges on a phosphor output layer that converts it back to a visible image. The visible image is observed through a conventional optical system that magnifies it by a factor of 5 back to its initial size.

Limitations of the optical magnification that can be obtained without loss of brightness, make it unprofitable to reduce the electron image to less than 1/5 the size of the x-ray image for the contemplated design.

The electrostatic acceleration has been held to a gain of 20 times to keep the tube down to a reasonable length.

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We are now completing clinical studies on a companion product—Crystalline Procaine Penicillin G for Aqueous Suspension. It will soon be available and, like all Heyden penicillin products, worthy of your complete confidence.

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